```
Set     Items   Description
S1      38735   (COMPLIANCE OR COMPLY? OR COMPLIANCY OR OBEDIENCE OR REQUI-
             REMENT?)(3N)(REPORT? OR BRIEF? OR INFORMATION OR RECORD? OR D-
             OCUMENT? OR FILE?)
S2    1708174   EMISSION OR EMIT OR EMITTED OR EMITTING OR EMITS OR (GIVE?
             OR SEND?)()OUT OR DISCHARG? OR AIR()POLLUT?
S3   13108100   CALCULAT? OR COMPUT? OR FIGURE? OR FIGURING OR MEASUR? OR -
             MODEL???
S4    7633370   FORMULA? OR VALUE? OR EXPRESSION? OR SCHEME? OR TECHNIQUE?
             OR ALGORITHM? OR RULE?
S5     770821   HYDROCARBON? ? OR HYDROCARBONACEOUS OR HYDROCARBONIC OR HY-
             DROCARBONOUS OR VOC OR VOLATILE()ORGANIC()COMPOUND?
S6     374248   TANK OR TANKS OR CONTAINER?
S7     227922   INTERNAL()COMBUSTION()ENGIN? OR PISTON()ENGIN? OR DIESEL?
S8       6383   EXTERNAL()COMBUSTION()ENGIN? OR STEAM()ENGIN?
S9       1254   GLYCOL()DEHYDRATION OR DRYING()NATURAL()GAS
S10         8   FLASH()EMISSION?
S11   1807254   TRANSFER? OR MOVE OR MOVING OR CONVEYANCE
S12      3422   HIGH()PRESSURE()LIQUID
S13         0   LOADING()LOSS()EMISSIONS
S14    111702   S2 (2N) S3
S15     22788   S2 (2N) S4
S16      3475   S14 AND S15
S17      1316   S15 AND S5
S18       338   S15 AND S6
S19       663   S15 AND S7
S20        10   S15 AND S8
S21         3   S15 AND S9
S22      5546   S14 AND S5
S23       974   S14 AND S6
S24      2285   S14 AND S7
S25        12   S14 AND S8
S26        14   S14 AND S9
S27         2   S3 AND S10
S28        27   S16 (5N)S5
S29         5   S16 (5N) S6
S30        16   S16 (5N )S7
S31        85   S20 OR S21 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30
S32        80   S31 NOT PY>2001
S33        79   S32 NOT PD>20010504
S34        70   RD (unique items)
S35        96   COMPREHENSIVE(2N)EMISSION?(3N)(FORMULA? OR CALCULAT? OR MO-
             DEL?)
S36        93   S35 NOT PY>2001
S37        93   S36 NOT PD>20010504
S38        67   RD (unique items)
File 105:AESIS 1851-2001/Jul
         (c) 2001 Australian Mineral Foundation Inc
File   8:Ei Compendex(R) 1970-2003/Aug W1
         (c) 2003 Elsevier Eng.  Info. Inc.
File 354:Ei EnCompassLit(TM) 1965-2003/Aug W2
         (c) 2003 Elsevier Eng. Info. Inc.
File 241:Elec. Power DB 1972-1999Jan
         (c) 1999 Electric Power Research Inst.Inc
File 103:Energy SciTec 1974-2003/Aug B1
         (c) 2003 Contains copyrighted material
File   2:INSPEC 1969-2003/Aug W1
         (c) 2003 Institution of Electrical Engineers
File  65:Inside Conferences 1993-2003/Aug W2
         (c) 2003 BLDSC all rts. reserv.
File  94:JICST-EPlus 1985-2003/Aug W1
         (c)2003 Japan Science and Tech Corp(JST)
File   6:NTIS 1964-2003/Aug W3
         (c) 2003 NTIS, Intl Cpyrght All Rights Res
File  95:TEME-Technology & Management 1989-2003/Jul W4
         (c) 2003 FIZ TECHNIK
File  87:TULSA (Petroleum Abs) 1965-2003/Aug W3
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38/5/1 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

06018164 E.I. No: EIP02116884278
Title: Recent validation efforts for a comprehensive **modal** emissions model
Author: Barth, Matthew; Malcolm, Carrie; Younglove, Theodore; Hill, Nicole
Corporate Source: College of Engineering Ctr. for Environ. Res. and Technol. University of California, Riverside, CA 92521, United States
Source: Transportation Research Record n 1750 2001. p 13-23
Publication Year: 2001
CODEN: TRREDM ISSN: 0361-1981
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical)
Journal Announcement: 0203W3
Abstract: Mobile source emissions estimation techniques play a critical role for regional planning and development of emission control strategies. The primary models for mobile source emissions estimation have been the U.S. Environmental Protection Agency's MOBILE model and the California Air Resources Board's EMFAC model. These models work well for large regional areas but are not as well suited for "microscale" evaluation. Over the last several years, the College of Engineering-Center for Environmental Research and Technology (CE-CERT) has been evaluating in-use, light-duty vehicles as part of NCHRP Project 25-11, resulting in the development of a **Comprehensive** Modal **Emissions Model** (CMEM). An essential part of any model development process is validating the model. Various validation techniques have been applied to CMEM. This paper describes some of the latest validation work carried out in comparing CMEM results to independent emission testing results (independent in both vehicles and driving cycles). Further, CMEM has been compared with the latest versions of EMFAC and MOBILE. In general, compared with the independent emission measurements, CMEM predicts well. It has been found that CMEM is consistent with MOBILE and EMFAC at low to medium speeds. Greater deviations were found at very low speeds and very high speeds. At high speeds, CMEM tends to predict higher hydrocarbon (HC) emissions and lower oxides of nitrogen (NO//x) emissions. At the very low speeds, CMEM tends to predict lower than EMFAC and MOBILE for all emissions. These comparisons are part of an ongoing validation process for development of CMEM. 16 Refs.
Descriptors: *Particulate emissions; Ground vehicles; Hydrocarbons; Nitrogen oxides; Environmental protection; Air pollution control
Identifiers: Mobile source emissions
Classification Codes:
451.1 (Air Pollution Sources); 804.1 (Organic Compounds); 804.2 (Inorganic Compounds); 454.2 (Environmental Impact & Protection); 451.2 (Air Pollution Control)
451 (Air Pollution); 662 (Automobiles & Smaller Vehicles); 804 (Chemical Products Generally); 454 (Environmental Engineering)
45 (POLLUTION, SANITARY ENGINEERING & WASTES); 66 (AUTOMOTIVE ENGINEERING); 80 (CHEMICAL ENGINEERING, GENERAL)

38/5/3 (Item 3 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05759466 E.I. No: EIP01015487016
Title: Modal-based intermediate soak-time emissions modeling
Author: An, Feng; Barth, Matthew; Scora, George; Ross, Marc
Corporate Source: Univ of California, Riverside, CA, USA
Source: Transportation Research Record n 1664 1999. p 58-67
Publication Year: 1999
CODEN: TRREDM ISSN: 0361-1981
Language: English
Document Type: JA; (Journal Article) Treatment: G; (General Review); T;

(Theoretical)
Journal Announcement: 0102W5
Abstract: A **comprehensive** modal **emissions model** for light-duty cars and trucks is being developed under the sponsorship of NCHRP Project 25-11. Model development has been described previously for vehicles operating under hot-stabilized conditions. A modal emissions model is presented for vehicles operated under incremental soak-time conditions. The Federal Test Procedure (FTP) measures vehicle emissions after a 24-h soak time during Bag 1 testing and vehicle emissions after a 10-min soak time during Bag 3 testing. Vehicle incremental soak-time emissions refer to vehicle emissions after intermediate variable soak times of between 10 min and 24 h. Recent research shows that most on-road vehicles experience soak times of between 10 min and 24 h during daily driving; thus, there is strong desire to model vehicle emissions under such circumstances. An intermediate soak emission model has been developed on the basis of second-by-second emissions measurements generated at the College of Engineering Center for Environmental Research and Technology, University of California-Riverside vehicle testing facility by using the FTP Bag 1 and Bag 3 test cycles. The modeling results are based on a composite vehicle concept in which more than 300 tested vehicles are composited into two dozen vehicle technology groups. The modeling approach is a fuel-based physical modal emissions model in which vehicles' fuel use, engine-out emissions, air/fuel equivalence ratio, catalyst efficiencies, and tailpipe emissions are modeled individually as a function of variable soak time. Since the developed model is based on modeled vehicle fuel consumption under any given driving cycle, it not only is capable of predicting vehicle emissions under variable soak time for any given test cycle but also is capable of predicting emissions under different starting test cycles. (Author abstract) 14 Refs.
Descriptors: *Air quality; Gas emissions; Mathematical models; Light weight vehicles; Trucks; Air pollution control; Environmental protection; Fuel consumption
Identifiers: Soak-time emissions modeling
Classification Codes:
451.2 (Air Pollution Control); 443.1 (Atmospheric Properties); 451.1 (Air Pollution Sources); 662.2 (Smaller Vehicles); 663.1 (Heavy Duty Motor Vehicles)
451 (Air Pollution); 443 (Meteorology); 921 (Applied Mathematics); 662 (Automotive Design & Manufacture); 663 (Heavy Duty Vehicles)
45 (POLLUTION & SANITARY ENGINEERING); 44 (WATER & WATERWORKS ENGINEERING); 92 (ENGINEERING MATHEMATICS); 66 (AUTOMOTIVE ENGINEERING)

38/5/4 (Item 4 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05759465 E.I. No: EIP01015487015
Title: Estimating emissions and fuel consumption for different levels of freeway congestion
Author: Barth, Matthew; Scora, George; Younglove, Theodore
Corporate Source: Univ of California, Riverside, CA, USA
Source: Transportation Research Record n 1664 1999. p 47-57
Publication Year: 1999
CODEN: TRREDM ISSN: 0361-1981
Language: English
Document Type: JA; (Journal Article) Treatment: G; (General Review); T; (Theoretical)
Journal Announcement: 0102W5
Abstract: To improve upon the speed correction factor methodology used by conventional emission models (i.e., MOBILE and EMFAC), the Environmental Protection Agency is introducing in its latest version of MOBILE (version 6) a new set of facility-specific driving cycles. These cycles represent driving patterns for different facility types (e.g., highway and arterial) and congestion conditions. Using a state-of-the-art **comprehensive** modal **emissions model** developed under NCHRP Project 25-11, one is able to predict the integrated emissions and fuel use values for these cycles for a

wide variety of vehicle-technology categories. These facility-congestion results are then compared with steady-state emissions-fuel use measurements that were made in deriving the modal model. Furthermore, cruise modes that have mild speed perturbations are also investigated. All of these results are then compared with the speed correction equations used in the conventional emissions factor models. It is found that the mild acceleration perturbations at high speeds can lead to significantly higher emissions compared with the steady-state values. Because of this, the new high-speed freeway driving cycles (representing higher levels of service) in many cases have (modeled) emissions higher than those for the cycles that represent lower levels of service. Fuel consumption by speed does not change drastically in the comparisons. (Author abstract) 11 Refs.

Descriptors: *Air quality; Gas emissions; Fuel consumption; Highway traffic control; Mathematical models; Computer simulation; Environmental protection; Air pollution control

Identifiers: Speed correction factor methodology

Classification Codes:

451.2 (Air Pollution Control); 443.1 (Atmospheric Properties); 451.1 (Air Pollution Sources); 525.3 (Energy Utilization); 432.4 (Highway Traffic Control); 406.1 (Highway Systems)

451 (Air Pollution); 443 (Meteorology); 525 (Energy Management); 432 (Highway Transportation); 406 (Highway Engineering)

45 (POLLUTION & SANITARY ENGINEERING); 44 (WATER & WATERWORKS ENGINEERING); 52 (FUEL TECHNOLOGY); 43 (TRANSPORTATION)

38/5/5 (Item 5 from file: 8)

05704287 E.I. No: EIP00115409032

Title: Emissions and energy comparison between a simulated automated highway system and current traffic conditions

Author: Barth, Matthew

Corporate Source: Univ of California, Riverside, CA, USA

Conference Title: 2000 IEEE Intelligent Transportation Systems Proceedings

Conference Location: Dearborn, MI, USA Conference Date: 20001001-20001003

Sponsor: IEEE

E.I. Conference No.: 57548

Source: IEEE Conference on Intelligent Transportation Systems, Proceedings, ITSC 2000. p 358-363

Publication Year: 2000

CODEN: 002845

Language: English

Document Type: JA; (Journal Article) Treatment: T; (Theoretical)

Journal Announcement: 0012W4

Abstract: An evaluation has been carried out in estimating the emissions and energy use (i.e., fuel consumption) associated with an Automated Highway System (AHS) using advanced simulation modeling tools. A detailed AHS microsimulation has been combined with a **comprehensive** modal **emissions** and energy consumption **model** to predict emissions and energy use for a modeled highway. The resulting AHS emissions and fuel consumption are compared to non-automated traffic at different levels of congestion, as well as idealized traffic flow. The results of this preliminary evaluation have shown that an AHS has slightly lower average fuel consumption than a non-automated highway operating at free-flow, and much lower average fuel consumption than a non-automated highway operating under congested conditions, because of its smoother traffic flow. Further, an AHS operating at 60 mph has substantially lower emissions per vehicle-mile traveled than non-automated traffic at the same average speed, again because of its smoother traffic flow. Vehicles that platoon in an AHS can expect an additional 5-15% fuel savings and emission reduction due to the aerodynamic drafting effect, which is dependent on the intra-platoon vehicle spacings. (Author abstract) 9 Refs.

Descriptors: *Intelligent vehicle highway systems; Highway traffic

control; Exhaust gases; Automation; Fuel consumption; Environmental impact
Identifiers: Automated highway system (AHS)
Classification Codes:
406.1 (Highway Systems); 723.5 (Computer Applications); 432.4 (Highway Traffic Control); 451.1 (Air Pollution Sources); 612.1 (Internal Combustion Engines, General)
406 (Highway Engineering); 723 (Computer Software); 432 (Highway Transportation); 451 (Air Pollution); 612 (Combustion Engines); 731 (Automatic Control Principles)
72 (COMPUTERS & DATA PROCESSING); 43 (TRANSPORTATION); 45 (POLLUTION & SANITARY ENGINEERING); 61 (PLANT & POWER ENGINEERING); 73 (CONTROL ENGINEERING)

38/5/6 (Item 6 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05704286 E.I. No: EIP00115409031
Title: Environmental evaluation of Intelligent Cruise Control (ICC) vehicles
Author: Bose, Arnab; Ioannou, Petros
Corporate Source: Univ of Southern California, Los Angeles, CA, USA
Conference Title: 2000 IEEE Intelligent Transportation Systems Proceedings
Conference Location: Dearborn, MI, USA Conference Date: 20001001-20001003
Sponsor: IEEE
E.I. Conference No.: 57548
Source: IEEE Conference on Intelligent Transportation Systems, Proceedings, ITSC 2000. p 352-357
Publication Year: 2000
CODEN: 002845
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical)
Journal Announcement: 0012W4
Abstract: During the last decade considerable research and development efforts have been devoted to automating vehicles in an effort to improve safety and efficiency of vehicle following. Several designs for automatic vehicle following controllers exist that satisfy stability criteria and ensure tight vehicle following. However, it is not known how these controllers will affect fuel consumption and air pollution in the presence/absence of traffic disturbances. The purpose of this paper is environmentally evaluate such a control system design, namely the Intelligent Cruise Control (ICC) system. This is done using a **Comprehensive** Modal **Emissions Model** (CMEM) that **calculates** vehicle emissions depending on its mode of operation, i.e. steady state cruise, acceleration/deceleration, among others. The ICC is designed to guarantee accurate speed and position tracking during `smooth' acceleration maneuvers. As a consequence, fuel consumption and air pollution is reduced by 8.5% and 8.1%-18.4% respectively due to the presence of 10% ICC vehicles during smooth acceleration maneuvers. Furthermore, human factor considerations dictate that the response of an ICC vehicle should be smooth. As a result, improvements of the order of 28.5% and 1.5%-60.6% can be observed during rapid acceleration transients in fuel consumption and air pollution levels, respectively, due to the presence of 10% semi-automated vehicles. Due to the randomness and uncertainties in human driving, the numbers obtained are qualitatively valid and demonstrate the beneficial effect of ICC vehicles on air quality and fuel consumption. (Author abstract) 9 Refs.
Descriptors: *Intelligent vehicle highway systems; Environmental impact; Research and development management; Automation; Accident prevention; System stability; Air pollution; Exhaust gases
Identifiers: Environmental evaluation; Intelligent cruise control (ICC) vehicles
Classification Codes:
406.1 (Highway Systems); 723.5 (Computer Applications); 454.2

(Environmental Impact & Protection); 901.3 (Engineering Research); 912.2 (Management)
406 (Highway Engineering); 723 (Computer Software); 454 (Environmental Engineering); 901 (Engineering Profession); 912 (Industrial Engineering & Management); 731 (Automatic Control Principles)
72 (COMPUTERS & DATA PROCESSING); 45 (POLLUTION & SANITARY ENGINEERING); 90 (GENERAL ENGINEERING); 91 (ENGINEERING MANAGEMENT); 73 (CONTROL ENGINEERING)

38/5/7 (Item 7 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05504269 E.I. No: EIP00035087417
Title: Thermal emission polarization
Author: Wolff, Lawrence B.; Lundberg, Andrew; Tang, Renjie
Corporate Source: Johns Hopkins Univ, Baltimore, MD, USA
Conference Title: Proceedings of the 1999 Polarization: Measurement, Analysis, and Remote Sensing II
Conference Location: Denver, CO, USA Conference Date: 19990719-19990721
Sponsor: SPIE
E.I. Conference No.: 56122
Source: Proceedings of SPIE - The International Society for Optical Engineering v 3754 1999. p 75-86
Publication Year: 1999
CODEN: PSISDG ISSN: 0277-786X
Language: English
Document Type: JA; (Journal Article) Treatment: G; (General Review)
Journal Announcement: 0005W1
Abstract: Existing polarization-based image understanding techniques use information only from reflected light. Apart from incandescent bodies thermally emitted light radiation from elements of a scene in the visible spectrum is insignificant. However, at longer wavelengths such as in the infrared thermal emission is typically quite prevalent from a number of scene elements of interest. FLIR imagery of both indoor and outdoor scenes reveals that many objects thermally emit a significant amount of radiation. Polarization from thermally emitting objects has been observed as long as 170 years ago from incandescent objects but since then there have only been a limited number of empirical investigations into this phenomenon. This paper presents a **comprehensive model** for explaining polarization of thermal **emission** from both rough and smooth surfaces, in agreement with empirical data, that can significantly enhance the image understanding of FLIR imagery. In particular it is possible to discern metal from dielectric materials under certain conditions, and from an accurate model for thermally emitted polarization it is possible to predictively model polarization signatures from CAD models of importance to automatic target recognition. (Author abstract) 8 Refs.
Descriptors: *Light polarization; Infrared imaging; Image understanding; Light reflection; Infrared radiation; Object recognition
Identifiers: Thermal emission; Light radiation; Automatic target recognition
Classification Codes:
741.1 (Light/Optics); 741.3 (Optical Devices & Systems)
741 (Optics & Optical Devices)
74 (OPTICAL TECHNOLOGY)

38/5/10 (Item 10 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05233285 E.I. No: EIP99020019915
Title: Modeling enleanment emissions for light-duty vehicles
Author: An, Feng; Barth, Matthew; Scora, George; Ross, Marc
Corporate Source: Univ of California, Riverside, CA, USA
Source: Transportation Research Record n 1641 Sep 1998. p 48-57

Publication Year: 1998
CODEN: TRREDM ISSN: 0361-1981
Language: English
Document Type: JA; (Journal Article) Treatment: G; (General Review)
Journal Announcement: 9904W3
Abstract: A **comprehensive** modal **emissions model** for light-duty cars and trucks is being developed under the sponsorship of NCHRP Project 25-11. Model development has been described previously for vehicles operating under stoichiometric and enrichment conditions. A modal emissions model is presented for vehicles operated under enleanment conditions. Enleanment typically occurs with sharp deceleration or load reduction events, and sometimes during long deceleration. Under enleanment conditions, the air/fuel ratio is lean and incomplete combustion or misfire occurs. Preliminary research indicates that enleanment emissions (particularly for hydrocarbons) contribute significantly to a vehicle's overall emissions. An enleanment emissions module has been developed on the basis of second-by-second emission measurements generated at the College of Engineering - Center for Environmental Research and Technology's vehicle testing facility using the Federal Test Procedure, US06, and a specially designed modal emission cycle (MEC01). On the basis of more than 200 vehicles tested and modeled, lean-burn hydrocarbon emissions (HC//l//e//a//n) account for 10 to 20 percent of the overall HC emissions under the various test cycles. HC//l//e//a//n emission contributions vary greatly from vehicle to vehicle, ranging from near 0 to more than 30 percent of total HC emissions of individual vehicles. After detailed analysis of the second-by-second emission data over the modal emission cycle MEC01, it was found that enleanment hydrocarbons emissions are mostly associated with rapid load reduction events and long deceleration events. The former is most likely to cause extremely high levels of HC as short spikes, and the latter is mostly associated with longer-lasting HC puffs. A methodology has been developed to characterize and model enleanment hydrocarbons emissions associated with these two events. The model estimates are compared with measurements, with encouraging results. (Author abstract) 11 Refs.
Descriptors: *Light weight vehicles; Gas emissions; Deceleration; Hydrocarbons; Carbon dioxide; Oxygen; Carbon monoxide; Nitrogen oxides
Identifiers: Enleanment emissions; Light duty vehicles; Modal emission cycle
Classification Codes:
662.2 (Smaller Vehicles); 451.1 (Air Pollution Sources); 931.1 (Mechanics); 804.1 (Organic Components); 804.2 (Inorganic Components)
662 (Automotive Design & Manufacture); 451 (Air Pollution); 931 (Applied Physics); 804 (Chemical Products)
66 (AUTOMOTIVE ENGINEERING); 45 (POLLUTION & SANITARY ENGINEERING); 93 (ENGINEERING PHYSICS); 80 (CHEMICAL ENGINEERING)

38/5/12 (Item 12 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05115866 E.I. No: EIP98094372955
Title: Integrating a modal emissions model into various transportation modeling frameworks
Author: Barth, Matthew
Corporate Source: Univ of California, Riverside, CA, USA
Conference Title: Proceedings of the 1998 Conference on Transportation Planning and Air Quality III
Conference Location: Lake Tahoe, CA, USA Conference Date: 19970817-19970820
Sponsor: ASCE
E.I. Conference No.: 48942
Source: Emerging Strategies and Working Solutions Proceedings of the Conference on Transportation Planning and Air Quality 1998. ASCE, Reston, VA, USA. p 38-50
Publication Year: 1998
CODEN: 003109

Language: English
Document Type: CA; (Conference Article) Treatment: T; (Theoretical)
Journal Announcement: 9811W1
Abstract: In order to address an important need in the transportation and air quality communities, a **comprehensive** modal **emissions model** is currently being developed under sponsorship of the National Cooperative Highway Research Program (NCHRP Project 25-11). The key objective of this research project is to develop and validate a computer model that accurately estimates the impacts of a vehicle's operating mode on emissions. This paper briefly describes research to date on the development of the model along with its associated vehicle testing program. The overall concept of the model is then described, followed by a discussion of how the modal emissions model can be integrated into various transportation modeling frameworks. Numerous integration issues are discussed, including vehicle fleet distribution, vehicle operating parameters, temporal level-of-detail, and vehicle aggregation. Different examples are given describing how the emissions model can be utilized by microscopic transportation simulation models, by mesoscopic models, and by the conventional macroscopic transportation planning models. (Author abstract) 8 Refs.
Descriptors: *Motor transportation; Exhaust gases; Gas emissions; Air pollution control; Computer simulation; Air quality
Identifiers: Modal emissions model; Transportation planning
Classification Codes:
451.1 (Air Pollution Sources); 451.2 (Air Pollution Control); 723.5 (Computer Applications)
432 (Highway Transportation); 451 (Air Pollution); 723 (Computer Software)
43 (TRANSPORTATION); 45 (POLLUTION & SANITARY ENGINEERING); 72 (COMPUTERS & DATA PROCESSING)

38/5/13 (Item 13 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

03928081 E.I. No: EIP94081370239
Title: Optimal SO//2 compliance planning using probabilistic production costing and generalized benders decomposition
Author: Huang, Wenxiong; Hobbs, Benjamin F.
Corporate Source: Energy Management Associates, Inc, Atlanta, GA, USA
Source: IEEE Transactions on Power Systems v 9 n 1 Feb 1994. p 174-180
Publication Year: 1994
CODEN: ITPSEG ISSN: 0885-8950
Language: English
Document Type: JA; (Journal Article) Treatment: X; (Experimental); T; (Theoretical); N; (Numerical)
Journal Announcement: 9410W2
Abstract: In 1990, the U.S. Congress passed a new Clean Air Act which contains provisions to control sulfur dioxide (SO//2, a primary cause of acid rain) emitted from electric generation plants in the United States. Under this Act, electric utilities will be able to choose from a wide range of SO//2 **emissions** control measures. This paper presents a **comprehensive emissions** control **model** which can systematically examine all available emissions control options and construct an optimal compliance plan. The model is a nonlinear integer program that uses probabilistic production costing to simulate system generation. A solution procedure based on Generalized Benders Decomposition (GBD) is developed, exploiting the special structure of the problem formulation. The GBD solution procedure employs an efficient method to calculate the derivatives of the expected,generation of a unit with respect to the capacity of another unit. (Edited author abstract) 26 Refs.
Descriptors: *Acid rain; Probability; Electric power plants; Electric utilities; Air pollution control; Mathematical models
Identifiers: Emission compliance planning; Generalized Benders Decomposition (GBD); Probabilistic production costing
Classification Codes:

451 (Air Pollution); 706 (Electric Transmission & Distribution); 641 (Heat & Thermodynamics); 921 (Applied Mathematics); 922 (Statistical Methods)
45 (POLLUTION & SANITARY ENGINEERING); 70 (ELECTRICAL ENGINEERING); 64 (HEAT & THERMODYNAMICS); 92 (ENGINEERING MATHEMATICS)

38/5/14 (Item 14 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

03749194 E.I. No: EIP93101118468
Title: On complete-data spaces for PET reconstruction algorithms
Author: Fessler, Jeffrey A.; Clinthorne, Neal H.; Rogers, W. Leslie
Corporate Source: Univ of Michigan, Ann Arbor, MI, USA
Conference Title: IEEE Nuclear Science Symposium and Medical Imaging Conference (NAA/MIC 92)
Conference Location: Orlando, FL, USA Conference Date: 19921025-19921031
Sponsor: IEEE
E.I. Conference No.: 19229
Source: IEEE Transactions on Nuclear Science v 40 n 4(Part1) Aug 1993. p 1055-1061
Publication Year: 1993
CODEN: IETNAE ISSN: 0018-9499
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical); X; (Experimental)
Journal Announcement: 9401W2
Abstract: As investigators consider more **comprehensive** measurement **models** for **emission** tomography, there will be more choices for the complete-data spaces of the associated expectation-maximization (EM) algorithms for maximum likelihood (ML) estimation. In this paper, we show that EM algorithms based on smaller complete-data spaces will typically converge faster. We discuss two practical applications of these concepts: (i) the ML-IB image reconstructions algorithms of Politte and Snyder which are based on measurement models that account for attenuation and accidental coincidences in positron-emission tomography (PET), and (ii) the problem of simultaneous estimation of emission and transmission parameters. Although the PET applications may often violate the necessary regularity conditions, our analysis predicts heuristically that the ML-IB algorithm, which has a smaller complete-data space, should converge faster than ML-IA. This is corroborated by the empirical findings in 1 right bracket . (Author abstract) 9 Refs.
Descriptors: *Positron emission tomography; Image reconstruction; Algorithms; Probability; Medical imaging
Identifiers: Maximum likelihood estimation
Classification Codes:
461.1 (Biomedical Engineering); 741.1 (Light/Optics); 922.1 (Probability Theory); 723.1 (Computer Programming)
461 (Biotechnology); 741 (Optics & Optical Devices); 922 (Statistical Methods); 723 (Computer Software)
46 (BIOENGINEERING); 74 (OPTICAL TECHNOLOGY); 92 (ENGINEERING MATHEMATICS); 72 (COMPUTERS & DATA PROCESSING)

38/5/15 (Item 15 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

02530347 E.I. Monthly No: EI8803025623
Title: EMISSIONS AND AIR QUALITY RELATIONSHIPS FOR ATMOSPHERIC TRACE METALS.
Author: Cass, Glen R.; McRae, Gregory J.
Corporate Source: California Inst of Technology, Pasadena, CA, USA
Source: Advances in Environmental Science and Technology v 17, Toxic Met in the Atmos. Wiley Ser in Adv in Environ Sci and Technol p 145-171

CODEN: AESTC9 ISSN: 0065-2563 ISBN: 0-471-82654-5
Language: ENGLISH
Document Type: MC; (Monograph Chapter) Treatment: T; (Theoretical); X; (Experimental)
Journal Announcement: 8803
Abstract: The purpose of this chapter is to illustrate methods available for quantifying the sources that contribute trace metals emissions to the atmosphere. Receptor-oriented air quality models are described that can identify the contribution of individual emission source types to the aerosol mass loading observed at community air monitoring sites. It is shown how trace metals emission inventories can be used to improve receptor **model** reliability. A **comprehensive emission** inventory procedure is developed for each of the individual trace metals released to the atmosphere. The consistency of these inventories is tested based on comparison of the relative abundancy of trace metals estimated from emissions data versus that measured in the atmosphere. Examples are given based on data available for Los Angeles, California and for Houston, Texas. 25 refs.
Descriptors: *METALLIC COMPOUNDS--*Toxicity; AIR POLLUTION--Particulate Emissions; AEROSOLS--Atmospheric; ATMOSPHERIC COMPOSITION--Mathematical Models
Identifiers: ATMOSPHERIC TRACE METALS; CHEMICAL MASS BALANCE; RECEPTOR MODELS; TRACE METALS EMISSIONS
Classification Codes:
804 (Chemical Products); 461 (Biotechnology); 451 (Air Pollution); 443 (Meteorology); 921 (Applied Mathematics)
80 (CHEMICAL ENGINEERING); 46 (BIOENGINEERING); 45 (POLLUTION & SANITARY ENGINEERING); 44 (WATER & WATERWORKS ENGINEERING); 92 (ENGINEERING MATHEMATICS)

38/5/16 (Item 16 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

00429593 E.I. Monthly No: EI7502007243 E.I. Yearly No: EI75002114
Title: PHOTOCHEMICAL AIR POLLUTION MODEL FOR THE LOS ANGELES AIR BASIN.
Author: Liu, M. K.; Reynolds, S. D.; Roth, P. M.; Seinfeld, J. H.
Corporate Source: Syst Appl Inc, San Rafael, Calif
Source: Heat Transf and Fluid Mech Inst, Proc, Pap, Oreg State Univ, Corvallis, Jun 12-14 1974 Pap 18, p 287-300. Distrib by Stanford Univ Press, Calif, 1974
Publication Year: 1974
Language: ENGLISH
Journal Announcement: 7502
Abstract: An air pollution simulation model capable of predicting concentration levels of carbon monoxide and the major photochemical pollutants -- nitric oxide, nitrogen dioxide, ozone, and hydrocarbons -- in the Los Angeles air basin is described. The model is based on the numerical solution of the three-dimensional, time-dependent, species-conservation equations, including chemical reactions. A **comprehensive emissions model** and inventory for the Los Angeles basin, one having a two-mile spatial resolution and a one-hour temporal resolution, has also been developed. The model has been applied to the simulation of a smoggy day in Los Angeles in 1969. The predicted pollutant concentrations at various locations have been compared with the corresponding measurements. 13 refs.
Descriptors: *AIR POLLUTION--*Mathematical Models
Classification Codes:
451 (Air Pollution); 921 (Applied Mathematics)
45 (POLLUTION & SANITARY ENGINEERING); 92 (ENGINEERING MATHEMATICS)

38/5/17 (Item 1 from file: 354)
DIALOG(R)File 354:Ei EnCompassLit(TM)

643433 EnCompassLit Document No.: 200007541

The sensitivity of PM(sub)2(sub).(sub)5 source-receptor relationships to atmospheric chemistry and transport in a three-dimensional air quality model

Author: Seigneur C.; Tonne C.; Vijayaraghavan K.; Pai P.; Levin L.
Corporate Source: Atmospheric/Environmental Res., Inc.; Sun Microsystems; Electric Power Research Institute
Source: Journal of the Air and Waste Management Association 50/3 428-435 (ISSN 1047--3289) (March 2000)
Language: English
ISSN: 1047--3289
CODEN: JIJME
Journal Name: Journal of the Air and Waste Management Association
Document Type: JOURNAL ARTICLE
Publication Date: 000000
Ei EnCompassLit Bulletin Headings: AIR POLLUTION; AIR QUALITY; HEALTH AND ENVIRONMENT; MEASUREMENT METHODS
Abstract:
Air quality model simulations constitute an effective approach to developing source-receptor relationships because a significant fraction of fine particulate matter (PM(sub)2(sub).(sub)5) is secondary, i.e., formed in the atmosphere and, thus, depends on the atmospheric chemistry of the airshed. A comprehensive three-dimensional air quality model for PM(sub)2(sub).(sub)5 (SAQM-AERO) was used to compare three approaches to generating episodic transfer coefficients (TC) for several source regions in the Los Angeles Basin. Transfer coefficients were developed by conducting PM(sub)2(sub).(sub)5 SAQM-AERO simulations with reduced emissions of one of four precursors, i.e., primary PM, SO(sub)2, NO(sub)x, and VOC, from each source region. TC was calculated using a simplified chemistry for PM(sub)2(sub).(sub)5 formation and simplifying assumptions on transport using information limited to basin-wide emission reductions. TC obtained with the simplified chemistry were similar to those obtained with the **comprehensive model** for VOC **emission** changes but differed for NO(sub)x and SO(sub)2 emission changes. The best agreement was obtained for VOC emission changes, and poor agreement was obtained for primary PM(sub)2(sub).(sub)5. Map, 6 diagrams, 3 graphs, 4 tables, and 17 references
Index Terms: AIR BASIN; AIR POLLUTANT; *AIR POLLUTION; *AIR QUALITY; AIRSHED; ATMOSPHERE; CALIFORNIA; COMPOSITION; COMPUTER PROGRAMING; COMPUTER SIMULATION; COMPUTING; CONCENTRATION; DIFFUSION; DIFFUSION COEFFICIENT; DISTRICT 5; EFFICIENCY; GROUP VA; GROUP VIA; IDE; LOS ANGELES; MAP; MASS TRANSFER; MASS TRANSFER COEFFICIENT; MATHEMATICAL MODEL; MATHEMATICS; MODEL; NITROGEN; NITROGEN OXIDE; NORTH AMERICA; OXYGEN; PARTICLE SIZE; *PARTICULATES; PHYSICAL PROPERTY; *POLLUTANT; *POLLUTION; *POLLUTION SOURCE; PROGRAMING; REGIONAL; SO2 CONTENT; SULFUR; SULFUR DIOXIDE; SULFUR OXIDE; USA; VOLATILE ORGANIC COMPOUNDS; VOLATILES CONTENT; *WASTE MATERIAL
CAS Registry Numbers: 11104-93-1; 12624-32-7 (BT); 7446-09-5
Sets of Linked Terms: 0005
Linked Terms:
AIR POLLUTANT; PARTICULATES; POLLUTANT; WASTE MATERIAL
AIR QUALITY; MATHEMATICAL MODEL; MODEL
12624-32-7 (BT); 7446-09-5; AIR POLLUTANT; GROUP VIA; IDE; OXYGEN; POLLUTANT; SULFUR; SULFUR DIOXIDE; SULFUR OXIDE; WASTE MATERIAL
11104-93-1; AIR POLLUTANT; GROUP VA; GROUP VIA; IDE; NITROGEN; NITROGEN OXIDE; OXYGEN; POLLUTANT; WASTE MATERIAL
AIR POLLUTANT; POLLUTANT; VOLATILE ORGANIC COMPOUNDS; WASTE MATERIAL

38/5/18 (Item 2 from file: 354)

638149 EnCompassLit Document No.: 200002257

Prediction of total oxides of nitrogen and nitrogen dioxide concentrations in a large urban area using a new generation urban scale dispersion model with integral chemistry model

Author: Owen B.; Edmunds H.A.; Carruthers D.J.; Singles R.J.
Corporate Source: Atmospheric Res./Information Centre, Dept. of Envtl. Sci./Geog. Science, Manchester Metropolitan University; Cambridge Envtl. Res. Consultants
Source: Atmospheric Environment 34/3 397-406 (ISSN 1352--2310) (2000)
Language: English
ISSN: 1352--2310
CODEN: ATENB
Journal Name: Atmospheric Environment
Document Type: JOURNAL ARTICLE
Publication Date: 000000
Ei EnCompassLit Bulletin Headings: AIR CHEMISTRY; AIR POLLUTION; AIR QUALITY; DATA CORRELATION AND PREDICTION METHODS; ENGINEERING; HEALTH AND ENVIRONMENT; PETROLEUM REFINING AND PETROCHEMICALS; SOURCES
Abstract:
The levels of total NO(sub)x and NO(sub)2 concentrations in London were **modeled** using a **comprehensive** urban **emissions** inventory (Greater London **Emissions** Inventory) and a multi-source dispersion model (ADMS-Urban), which has an integral chemistry model. Predictions based on this integrated modelling system were compared with observed data at four locations. The ADMS-Urban model interface with the emissions inventory and the geographical information system platform of the model offered an effective platform for the assessment of a large number of emission sources over a wide urban area. The model and inventory performance was acceptable when modelled values were compared with measured data although certain limitations still need to be addressed. 5 Tables, 1 map, 2 graphs and 28 references
Index Terms: AIR POLLUTANT; COMPOSITION; CONCENTRATION; DATA CORRELATION; DISTRIBUTION; EMISSION INVENTORY; *ENGLAND; *ENVIRONMENTAL PROTECTION; *EUROPE; FULL SCALE; *GROUP VA; *GROUP VIA; *IDE; MATHEMATICAL MODEL; MODEL; *NITROGEN; *NITROGEN OXIDE; *NITROGEN OXIDE, NO2; *OXYGEN; POLLUTANT; *UNITED KINGDOM; URBAN; WASTE MATERIAL
CAS Registry Numbers: *10102-44-0; *11104-93-1 (BT)
Sets of Linked Terms: 0002
Linked Terms:
10102-44-0; 11104-93-1 (BT); AIR POLLUTANT; GROUP VA; GROUP VIA; IDE; NITROGEN; NITROGEN OXIDE; NITROGEN OXIDE, NO2; OXYGEN; POLLUTANT; WASTE MATERIAL
DISTRIBUTION; MATHEMATICAL MODEL; MODEL

38/5/19 (Item 3 from file: 354)

0607186 EnCompassLit Document No.: 4504726
Scaling laws for NOx emission performance of burners and furnaces from 30 kW to 12 MW
Author: Hsieh T C A; Dahm W J A; Driscoll J F
Corporate Source: University of Michigan
Source: Combustion and Flame (ISSN 0010-2180) V114 N.1-2 54-80 (July 1998)
Language: English
ISSN: 0010-2180
CODEN: CBFMAO
Journal Name: Combustion and Flame
Document Type: JOURNAL ARTICLE
Publication Date: 980700
Ei EnCompassLit Bulletin Headings: AIR POLLUTION SOURCES; FLAMES AND COMBUSTION; HEALTH & ENVIRONMENT; PETROLEUM REFINING AND PETROCHEM
Abstract:
Scaling laws for NO(sub)x emission performance of burners and furnaces from 30 kW to 12 MW. A model based on results from a set of collaborative burner scaling experiments on gas burners of identical geometry but diameters ranging from 27 to 549 mm, provided the first NO(sub)x scaling data for burners with heat outputs from 30 kw to 12 Mw, including input-output measurements, as well as detailed in-flame measurements of NO(sub)x, CO, O(sub)2, unburned hydrocarbons,

temperature, and velocities at each of five burner sizes. The underlying physics of the four NO(sub)x production regions lead to scaling laws for their respective contributions to the overall NO(sub)x emissions performance. The relative importance of each region depends on the burner scale and operating conditions. The results were combined in a **comprehensive** scaling **model** for NO(sub) **emissions** performance which showed good agreement with experimental data at all burner scales over the entire range of turndown, staging, preheat, and excess air dilution, with correlations generally exceeding 90%. Tables, graphs, diagrams, and references

Index Terms: AIR; AIR FUEL RATIO; AIR POLLUTANT; *BURNER; CARBON; CARBON MONOXIDE; CARBON OXIDE; CO CONTENT; COMBUSTION; COMPOSITION; COMPOUNDS; DILUTING; ELEMENT; FLAME; *FURNACE; GROUP IVA; *GROUP VA; *GROUP VIA; HEAT; *HEATING EQUIPMENT; HYDROCARBON; *IDE; MEASURING; MODEL; *NITROGEN; *NITROGEN OXIDE; OPERATING CONDITION; *OXYGEN; OXYGEN CONTENT; POLLUTANT; PREHEATING; SIZE; TEMPERATURE; UNBURNED HYDROCARBON ; VELOCITY; WASTE MATERIAL

CAS Registry Numbers: *11104-93-1; 12795-06-1 (BT); 630-08-0

Sets of Linked Terms: 0005

Linked Terms:

11104-93-1; AIR POLLUTANT; GROUP VA; GROUP VIA; IDE; MODEL; NITROGEN; NITROGEN OXIDE; OXYGEN; POLLUTANT; WASTE MATERIAL

12795-06-1 (BT); 630-08-0; AIR POLLUTANT; CARBON; CARBON MONOXIDE; CARBON OXIDE; GROUP IVA; GROUP VIA; IDE; OXYGEN; POLLUTANT; WASTE MATERIAL

ELEMENT; GROUP VIA; OXYGEN

AIR POLLUTANT; COMPOUNDS; HYDROCARBON; POLLUTANT; UNBURNED HYDROCARBON; WASTE MATERIAL

BURNER; FURNACE; HEATING EQUIPMENT; SIZE

38/5/20 (Item 4 from file: 354)

0603043 EnCompassLit Document No.: 4531886

A comprehensive model **of nitrogen oxides** emissions **from gasoline engines**

Author: Narayanan S S

Source: Southern Illinois University at Carbondale, Dissertation (1997) 146P (Order from UMI as No. DA9808839; DAI abstract edited by API EnCompass) (Abstract) Dissertation Abstracts International: Section B Science & Engineering (ISSN 0419-4217) V58 N.9 5075-B (March 1998) (Order from UMI as No. DA9808839; DAI abstract edited by API EnCompass)

Language: English

ISSN: 0419-4217

CODEN: DABBBA

Journal Name: Dissertation Abstracts International: Section B Science & Engineering

Document Type: JOURNAL ARTICLE; ABSTRACT; THESIS

Publication Date: 970000

Ei EnCompassLit Bulletin Headings: AIR POLLUTION SOURCES; AUTOMOTIVE; AUTOMOTIVE POLLUTION SOURCES; HEALTH & ENVIRONMENT

Abstract:

A **comprehensive model** of nitrogen oxides **emissions** from gasoline engines. An engine simulation code was written which includes the contributions of the N(sub)2O and prompt NO mechanisms, in addition to the Zeldovich reactions, to the total NO(sub)x formed in gasoline engines. The increased NO(sub)x formation occurring under turbulent engine conditions was accounted for by including the effect of turbulent temperature fluctuation on the reaction rates of the NO(sub)x forming reactions. An abbreviated set of 34 reactions was drawn up to model engine NO(sub)x emissions due to the Zeldovich, N(sub)2O, and prompt NO mechanisms. Steady state and partial equilibrium assumptions further simplified the abbreviated set. Differential equations governing the turbulent temperature fluctuations during the engine cycle were derived from fluid mechanical principles and solved in the

simulation code. Turbulent temperature fluctuations increased NO(sub)x emissions by .approx. 30%. The N(sub)2O mechanism contributed .ltoreq. 7%, and the prompt mechanism .approx. 11% of the total NO(sub)x

Index Terms: ABSTRACT; *AIR POLLUTANT; COMBUSTION; COMPUTER SIMULATION; COMPUTING; CYCLE; DIFFERENTIAL EQUATION; ENGINE; EQUATION; EQUILIBRIUM; *EXHAUST GAS; FLUID FLOW; *GROUP VA; *GROUP VIA; *IDE; INTERNAL COMBUSTION ENGINE; KINETICS; MATHEMATICAL MODEL; MATHEMATICS; MODEL; *NITROGEN; *NITROGEN OXIDE; *NITROGEN OXIDE, N2O; NITROGEN OXIDE, NO; OPERATING CONDITION; *OXYGEN; *POLLUTANT; POLLUTION SOURCE; REACTION MECHANISM; SPARK IGNITION ENGINE; STEADY STATE; TEMPERATURE; THESIS; TURBULENT FLOW; *WASTE GAS; *WASTE MATERIAL

CAS Registry Numbers: *10024-97-2; 10102-43-9; *11104-93-1 (BT)

Sets of Linked Terms: 0004

Linked Terms:

10024-97-2; 11104-93-1 (BT); AIR POLLUTANT; GROUP VA; GROUP VIA; IDE; NITROGEN; NITROGEN OXIDE; NITROGEN OXIDE, N2O; OXYGEN; POLLUTANT; WASTE MATERIAL

10102-43-9; 11104-93-1 (BT); AIR POLLUTANT; GROUP VA; GROUP VIA; IDE; NITROGEN; NITROGEN OXIDE; NITROGEN OXIDE, NO; OXYGEN; POLLUTANT; WASTE MATERIAL

COMBUSTION; CYCLE

AIR POLLUTANT; ENGINE; EXHAUST GAS; INTERNAL COMBUSTION ENGINE; MATHEMATICAL MODEL; MODEL; POLLUTANT; SPARK IGNITION ENGINE; WASTE GAS; WASTE MATERIAL

38/5/21 (Item 5 from file: 354)

0593061 EnCompassLit Document No.: 4435015

A new scaling methodology for NOx emissions performance of gas burners and furnaces

Author: Hsieh T C

Source: University of Michigan, Dissertation (1997) 192P (UMI Publication No. DA9722002) (Abstract) Dissertation Abstracts International: Section B Science & Engineering (ISSN 0419-4217) V58 N.2 821-B (August 1997) (UMI Publication No. DA9722002)

Language: English

ISSN: 0419-4217

CODEN: DABBBA

Journal Name: Dissertation Abstracts International: Section B Science & Engineering

Document Type: JOURNAL ARTICLE; ABSTRACT; THESIS

Publication Date: 970000

Ei EnCompassLit Bulletin Headings: AIR POLLUTION CONTROL; AIR POLLUTION SOURCES; ENVIRONMENT, TRANSPORT & STORAGE; HEALTH & ENVIRONMENT; MEASUREMENT METHODS

Abstract:

A new scaling methodology for NO(sub)x emissions performance of gas burners and furnaces. A general burner and furnace scaling methodology is presented, together with the resulting scaling model for NO(sub)x emissions performance of a broad class of swirl-stabilized industrial gas burners. The model is based on results from a set of novel burner scaling experiments on a generic gas burner and furnace design at five different scales having near-uniform geometric, aerodynamic, and thermal similarity and uniform measurement protocols. These provide the first NO(sub)x scaling data over the range of thermal scales from 30 kW to 12 MW, including input-output measurements as well as detailed in-flame measurements of NO, NO(sub)x, CO, O(sub)2, unburned hydrocarbons, temperature, and velocities at each scale. The in-flame measurements allow identification of key sources of NO(sub)x production. The underlying physics of these NO(sub)x sources lead to scaling laws for their respective contributions to the overall NO(sub)x emissions performance. It is found that the relative importance of each source depends on the burner scale and operating conditions. Simple furnace residence time scaling is shown to be largely

irrelevant, with NO(sub)x emissions instead being largely controlled by scaling of the near-burner region. The scaling for these NO(sub)x sources are combined in a **comprehensive** scaling **model** for NO(sub)x **emission** performance. Results from the scaling model show good agreement with experimental data at all burner scales and over the entire range of turndown, staging, preheat, and excess air dilution, with correlations generally exceeding 90%. The scaling model permits design trade-off assessments for a broad class of burners and furnaces, and allows performance of full industrial scale burners and furnaces of this type to be inferred from results of small scale tests

Index Terms: ABSTRACT; AIR; AIR FUEL RATIO; AIR POLLUTANT; BURNER; CARBON; CARBON MONOXIDE; CARBON OXIDE; *CLEAN BURNING; CO CONTENT; COMBUSTION; COMPOSITION; COMPOUNDS; DILUTING; ELEMENT; ENVIRONMENTAL PROTECTION; FLAME; FLUID FLOW; FULL SCALE; FURNACE; GASEOUS FUEL; GROUP IVA; *GROUP VA; *GROUP VIA; HEATING EQUIPMENT; HEATING FUEL; HYDROCARBON; *IDE; MEASURING; *MODEL; MONITORING; MULTISTAGE; NATURAL GAS; *NITROGEN; *NITROGEN OXIDE; NITROGEN OXIDE, NO; OPERATING CONDITION; *OXYGEN; OXYGEN CONTENT; PHYSICAL PROPERTY; POLLUTANT; PREHEATING; REACTION TIME ; STABILITY; SWIRL; TEMPERATURE; THESIS; UNBURNED HYDROCARBON; VELOCITY ; WASTE MATERIAL

CAS Registry Numbers: 10102-43-9; *11104-93-1; 11104-93-1 (BT); 12795-06-1 (BT); 630-08-0

Sets of Linked Terms: 0006

Linked Terms:

10102-43-9; 11104-93-1; 11104-93-1 (BT); AIR POLLUTANT; GROUP VA; GROUP VIA; IDE; MODEL; NITROGEN; NITROGEN OXIDE; NITROGEN OXIDE, NO; OXYGEN; POLLUTANT; WASTE MATERIAL

GASEOUS FUEL; HEATING FUEL; NATURAL GAS

12795-06-1 (BT); 630-08-0; AIR POLLUTANT; CARBON; CARBON MONOXIDE; CARBON OXIDE; GROUP IVA; GROUP VIA; IDE; OXYGEN; POLLUTANT; WASTE MATERIAL

AIR POLLUTANT; COMPOUNDS; HYDROCARBON; POLLUTANT; UNBURNED HYDROCARBON; WASTE MATERIAL

ELEMENT; GROUP VIA; OXYGEN

COMBUSTION; MULTISTAGE

38/5/22 (Item 6 from file: 354)

0555630 EnCompassLit Document No.: 4287015 Petroleum Abstr PE 611615

Minerals Management Service Outer Continental Shelf Activity Database (MOAD)

Author: Steiner C K; Causley M C; Yocke M A
Corporate Source: Systems Applications Intl

Source: US Dep. Interior MMS Gulf of Mex. Reg. OCS Study Rep. No.MMS 94-0018 (April 1994) 25P Petroleum Abstracts (ISSN 0031-6423) ABSTR. NO. 611,615 V35 N.47 (11/25/95)
Language: English
ISSN: 0031-6423
Journal Name: Petroleum Abstracts
Document Type: ABSTRACT
Publication Date: 940400
Ei EnCompassLit Bulletin Headings: AIR POLLUTION SOURCES; ATMOSPHERIC INTERACTION; HEALTH & ENVIRONMENT

Abstract:

Minerals Management Service Outer Continental Shelf Activity Database (MOAD). The 1990 Clean Air Act Amendments require the Minerals Management Service (MMS) to conduct a research study to assess the potential onshore air quality impact from the development of outer continental shelf (OCS) petroleum resources in the Gulf of Mexico, based on concern about the cumulative impacts of current and future OCS emissions on ozone concentrations on nonattainment areas, particularly in Texas and Louisiana. To make quantitative assessments of these impacts, MMS commissioned an air quality study, which includes as a major component the development of a **comprehensive emission**

inventory for photochemical grid **modeling** . The emission inventories prepared include both onshore and offshore emissions. All relevant emissions from anthropogenic and biogenic sources are considered, with special attention focused on offshore anthropogenic sources including OCS oil and gas production facilities, crew and supply vessels and helicopters serving OCS facilities, commercial shipping and fishing, recreational boating, intercoastal barge traffic, and other sources located in the adjacent state waters. The database created during this study, which contains the activity information collected for the development of the OCS platform and crew/supply vessel and helicopter emission inventories, is described

Index Terms: ABSTRACT; AIR POLLUTANT; *AIR QUALITY; AIRCRAFT; AMENDMENT; ANIMAL; BARGE; CLEAN AIR ACT; COMMERCIAL; COMPOSITION; CONCENTRATION; CONTINENTAL SHELF; CRUDE OIL; CRUDE OIL (WELL); *DATA BASE; DISTRICT 3; ECONOMIC FACTOR; ELEMENT; EMISSION INVENTORY; ENVIRONMENTAL IMPACT; FISH; GROUP VIA; *GULF; *GULF OF MEXICO; HELICOPTER; *INFORMATION SERVICE; LEGAL CONSIDERATION; LOUISIANA; MINERAL; NATURAL GAS; NONATTAINMENT AREA; *NORTH AMERICA; OFFSHORE; *OFFSHORE STRUCTURE; OIL AND GAS FIELDS; ONSHORE; OXIDANT; OXYGEN; OZONE; PERSONNEL; PHOTOCHEMICAL REACTION; POLLUTANT; POLLUTION SOURCE; RECOVERY; REPORT; SHIP; TEXAS; TRAFFIC; TRANSPORTATION; USA; WASTE MATERIAL

CAS Registry Numbers: 10028-15-6

Sets of Linked Terms: 0003

Linked Terms:

10028-15-6; AIR POLLUTANT; ELEMENT; GROUP VIA; OXIDANT; OXYGEN; OZONE; POLLUTANT; WASTE MATERIAL

OFFSHORE; OIL AND GAS FIELDS

AIR QUALITY; OFFSHORE; ONSHORE; POLLUTION SOURCE

38/5/23 (Item 7 from file: 354)

0527647 EnCompassLit Document No.: 4103543

Recent advances from the USA Auto/Oil Air Quality Improvement Research ((AQIR)) Program

Author: Kozinski A A; Lawrence D K
Corporate Source: Amoco Oil Co

Source: 14th World Petroleum Congress (Stavanger, Norway 5/29-6/1/94) Preprint (ISSN 0084-2176) N.10.1 (1994) 9P
Language: English
ISSN: 0084-2176
CODEN: WPCPAU
Journal Name: World Petroleum Congress, Preprints
Document Type: MEETING PAPER
Publication Date: 940529
Ei EnCompassLit Bulletin Headings: AIR POLLUTION CONTROL; ECONOMIC FACTOR; ENVIRONMENT, TRANSPORT & STORAGE; FUEL REFORMULATION; HEALTH & ENVIRONMENT; MOTOR FUELS; PETROLEUM PRODUCTS; PETROLEUM REFINING AND PETROCHEM

Abstract:

Recent advances from the USA Auto/Oil Air Quality Improvement Research ((AQIR)) Program. To address the issues of vehicle emissions and their impact on ambient air quality, primarily ozone formation, the US automobile manufacturers and 14 major oil companies started a cooperative research program, the Auto/Oil AQIR, in 1989. The objectives of the .approx. $37 million program are to provide regulatory agencies with a **comprehensive** database on vehicle **emissions** , air **modeling** to relate emissions to atmospheric ozone levels, and economic consequences of the proposed fuel quality changes. The first phase of the study showed that changes in fuel composition, primarily lower Rvp and reduced concentrations of sulfur, light olefins, and heavy fractions, i.e., T(sub)9(sub)0 (90% distillation point), can help reduce vehicle emissions. Addition of oxygenates or reduction of aromatics, however, will not reduce ozone. The second phase of the study investigated in more detail the effects of sulfur

content and T(sub)9(sub)0, the relationship between actual and test emissions, emissions from alternative fuel (e.g., methanol) vehicles, and costs of gasoline reformulation (including MTBE blending) and use of M85 (85% methanol/gasoline) fuel. Tables, graphs, and 16 references

Index Terms: ADDITIVE; AIR; AIR POLLUTANT; *AIR QUALITY; ALCOHOL CONTENT; AMOCO; AROMATIC HYDROCARBON; ATMOSPHERE; AUTOMOBILE; AUTOMOTIVE EXHAUST GAS; BENZENE RING; BLENDING; BRANCHED CHAIN; C1; C5; CLEAN BURNING; COMPOSITION; COMPOUNDS; CONCENTRATION; COST; DATA BASE; DEAROMATIZATION ; DISTILLATION; *ECONOMIC FACTOR; ECONOMIC IMPACT; ELEMENT; ENVIRONMENTAL IMPACT; ETHER; EXHAUST GAS; *GASOHOL; GROUP VIA; HYDROCARBON; IMPURITY; INDUSTRIAL PLANT; INFORMATION SERVICE; INVESTMENT; *LEGAL CONSIDERATION; LOW MOLECULAR WEIGHT; MANUFACTURER; MEETING PAPER; METHANOL; METHANOL CONTENT; MIXING; MODEL; MOLECULAR WEIGHT; MONOHYDROXY; *MOTOR FUEL; *MOTOR GASOLINE; MOTOR VEHICLE; NORTH AMERICA; OCTANE BOOSTER; OIL REFINERY; OLEFIN; OXIDANT; OXYGEN; OXYGEN ORGANIC; OZONE; PHYSICAL PROPERTY; PHYSICAL SEPARATION; POLLUTANT; PRODUCT QUALITY; *REFORMULATED GASOLINE; REID VAPOR PRESSURE; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SULFUR; SULFUR CONTENT; TERT-BUTYL METHYL ETHER; THERMODYNAMIC PROPERTY; TREATING; UNSATURATED; USA; *USE; VAPOR PRESSURE; WASTE GAS; WASTE MATERIAL

CAS Registry Numbers: 10028-15-6; 1634-04-4; 67-56-1

Sets of Linked Terms: 0008

Linked Terms:

10028-15-6; AIR POLLUTANT; ELEMENT; GROUP VIA; OXIDANT; OXYGEN; OZONE; POLLUTANT; WASTE MATERIAL

AIR; MODEL

COMPOUNDS; GROUP VIA; IMPURITY; SULFUR

COMPOUNDS; HYDROCARBON; OLEFIN; UNSATURATED

COMPOUNDS; OXYGEN ORGANIC

AROMATIC HYDROCARBON; BENZENE RING; COMPOUNDS; HYDROCARBON

67-56-1; C1; METHANOL; MONOHYDROXY; MOTOR FUEL; SATURATED CHAIN; SINGLE STRUCTURE TYPE; USE

1634-04-4; ADDITIVE; BRANCHED CHAIN; C5; ETHER; OCTANE BOOSTER; SATURATED CHAIN; SINGLE STRUCTURE TYPE; TERT-BUTYL METHYL ETHER; USE

38/5/24 (Item 8 from file: 354)

0506979 EnCompassLit Document No.: 4030960

Optimization of emission controls for electric utilities using probabilistic production costing and generalized benders decomposition ((GBD))

Author: Huang W X

Source: Case Western Reserve University, Dissertation, :200p. (1992) (Abstract) Dissertation Abstracts International: Section B Science & Engineering (ISSN 0419-4217) V53 N.7 3746-B (January 1993) (Order from University Microfilms International as No. DA9236349)

Language: English

ISSN: 0419-4217

CODEN: DABBBA

Journal Name: Dissertation Abstracts International: Section B Science & Engineering

Document Type: JOURNAL ARTICLE; ABSTRACT; THESIS

Publication Date: 930100

Ei EnCompassLit Bulletin Headings: ECONOMIC FACTOR; HEALTH & ENVIRONMENT; LEGAL CONSIDERATIONS

Abstract:

Optimization of emission controls for electric utilities using probabilistic production costing and generalized benders decomposition ((GBD)). A **comprehensive emission** control **model** , which can examine all available emission control options and construct an optimal SO(sub)2 compliance plan, was developed. The model's formulation was based on state of the art probabilistic production costing techniques, which are now a standard approach used by utilities and regulatory

commissions to forecast generating unit output and costs. A solution procedure was developed which exploits the special structure of the GBD formulation. The emission control model was applied to an utility system to find the optimal compliance plan under a set of emission allowance prices. It was shown that the GBD solution procedure is effective in solving this problem. An efficient method to calculate the derivative of the expected generation of a unit with respect to the capacity of an other unit was presented. Besides their use in the GBD solution procedure to obtain the Lagrangian multipliers, these derivatives are also useful in many other utility planning problems

Index Terms: ABSTRACT; AIR POLLUTANT; BUSINESS OPERATION; CAPACITY; *COST; *COST ANALYSIS; *ECONOMIC ANALYSIS; *ECONOMIC FACTOR; EFFICIENCY; GENERATING; GROUP VIA; IDE; *INDUSTRIAL PLANT; LEGAL CONSIDERATION; MANAGEMENT; MATHEMATICS; MODEL; OPERATIONS RESEARCH; OPTIMIZATION; OXYGEN; PLANNING; POLLUTANT; *POLLUTION CONTROL; *POWER PLANT; PREDICTION; PRICE; PUBLIC UTILITY; STATE OF THE ART; SULFUR; SULFUR DIOXIDE; SULFUR OXIDE; THESIS; WASTE MATERIAL

CAS Registry Numbers: 12624-32-7; 7446-09-5

Sets of Linked Terms: 0002

Linked Terms:

MODEL; POLLUTION CONTROL

12624-32-7; 7446-09-5; AIR POLLUTANT; GROUP VIA; IDE; OXYGEN; POLLUTANT ; SULFUR; SULFUR DIOXIDE; SULFUR OXIDE; WASTE MATERIAL

38/5/25 (Item 1 from file: 241)

1066116 SUBFILE: EPRI TECHNICAL REPORT

Analyzing Health Risks Due to Trace Substance Emissions From Utility Fossil-Fired Plants

REPORT NUMBER: EPRI TR-109206 0068p.

CONTRACT/GRANT NO.: WO3081-02

DOCUMENT TYPE: Final Report

PUBLICATION YEAR: 1997 12

EPRI DIVISION NAME: Environment Group

EPRI PROJECT MANAGER: Levin, Leonard;Dr.

PERFORMING ORG.: DFI/Aeronomics

DATE ENTERED: 980130 DATE UPDATED: 980909

This report describes several studies conducted to help individual utilities better understand the potential health risks associated with trace substance emissions from electric utility power plants. It describes specialized risk assessments conducted by incorporating plant-specific data into a modeling framework to tailor the analysis for an individual utility. The report also describes CRAFT, the Comprehensive Risk Assessment Framework for Toxics software package developed to perform these utility-wide air toxics risk assessments.

BACKGROUND: EPRI has undertaken a number of projects addressing a range of issues associated with potential health effects due to emissions from utilities. The major project that has served as the foundation for EPRI's trace substance exposure and risk research is the Comprehensive Risk Evaluation (CORE) project. This and other projects culminated in the 1994 EPRI report, "Electric Utility Trace Substances Synthesis Report" (TR 104614), which provides results from a nationwide risk assessment of each utility steam generating unit and power plant in the U.S. CRAFT extends the existing CORE analysis methods, models, data, and scenarios. It also incorporates site-specific input parameters to produce risk results that go beyond those in the nationwide and utility-wide studies.

OBJECTIVE: To describe the air toxics risk assessment methodology used in recent case studies; to summarize results of case studies carried out on entire utility systems; and to provide an overview of the function and use of CRAFT.

APPROACH: Researchers combined detailed site-specific exposure assessments with dose-response relationships to provide an estimate of potential public health risk due to inhalation of utility-emitted trace substances. The assessments encompassed both cancer and noncancer health

effects resulting from emissions of 15 trace substances from 40 power plants throughout the U.S. Researchers combined utility-specific operating data for 1995 and projected data for 2010 with characterization of trace element concentrations in utility fuels using statistical correlations to estimate trace substance emissions from individual units. The analyses used plant operations, design characteristics, control configurations and meteorological data to model transport and dispersion, and to estimate the ground-level concentrations due to emissions from plant stacks. The researchers also computed the incremental increase in inhalation cancer risk for a maximally exposed individual(MEI). For most carcinogens, researchers used the unit risk factors (URFs) in the U.S. EPA Integrated Risk Information System (IRIS) to estimate health effects. For noncarcinogens, they compared the estimated concentrations to inhalation reference concentrations (RfCs). Researchers evaluated several scenarios to gain insight into the risk implications of alternative choices in modeling parameters. They used two sets of modeling assumptions: the EPRI and EPA Base Case scenarios, which differ primarily in the cancer potency assumptions concerning nickel and arsenic. To refine the estimation, the project team incorporated unit-specific data into the CORE framework. In another scenario, they selected a complex terrain dispersion option to determine the sensitivity of incorporating terrain data into the analysis of ground-level concentrations to which the community might be exposed.

RESULTS: Under both the EPRI and EPA Base Case assumptions, all MEI inhalation carcinogenic risks for the power plants were below 10 to the minus 6th power. When switching from the EPRI to the EPA Base Case scenario, oil-fired plants showed the greatest increase in both MEI risk and annual population incidence of potential cancer cases. In both operating years modeled, all plants assessed had an inhalation hazard index less than 1, indicating that maximum downwind concentrations did not exceed the RfCs for any substance. Comparing risk results using the operating data obtained from industry public databases, with those provided by the utility, shows that the industry databases used earlier by EPRI result in more conservative risk estimates for future operations compared to updated data from plant operators, for most plants included in the case study. Switching from emission factors based on EPRI research to those based on utility measurements results in a slight decrease in MEI risk. This shows the EPRI methodology to be a more conservative approach. Incorporating terrain data into the dispersion model results in a modest increase in risk measures for most plants. CRAFT is capable of generating risk results for any number of scenarios defined by the user. Once a user defines a case, CRAFT calculates trace substance emissions and runs the dispersion model to estimate the ground-level concentration due to source emissions. It also performs standard risk calculations to generate the potential inhalation risks associated with the trace substance emissions.

EPRI PERSPECTIVE: Both the Case Studies and CRAFT include much of the data and methodologies developed in the CORE framework, yet provide additional analytical capabilities. Although the project team conducted the Case Studies and CRAFT as separate efforts, improving analyses such as those performed for the case studies will rely heavily on the capabilities of CRAFT. Because researchers developed CRAFT with the capability to allow a user to tailor an analysis, they intend to leverage it in future Case Study work. Future developments of CRAFT will assure that it is a tool with a solid foundation based on EPRI's CORE project, yet is flexible and comprehensible for users.

TECHNICAL INTEREST AREA: H3001 Air Quality

DESCRIPTORS: Economics; Risk Management; Air Toxics; Exposure Assessment ; Trace Metals; Air Quality Models

IDENTIFIERS: CRAFT; CORE; HEALTH RISKS

38/5/26 (Item 2 from file: 241)

1062088 SUBFILE: EPRI TECHNICAL REPORT

Design of a Framework for the Development of a Comprehensive Modeling System for Air Pollution

REPORT NUMBER: EPRI TR-106852 0236p.
CONTRACT/GRANT NO.: RP4311-02
DOCUMENT TYPE: Final Report
PUBLICATION YEAR: 1996 09
EPRI DIVISION NAME: Environment Group
EPRI PROJECT MANAGER: Hansen, Dr. D. Alan;Dr.
PERFORMING ORG.: Electric Power Research Institute
DATE ENTERED: 961107 DATE UPDATED: 970807

Distributed computer systems hold the potential to revolutionize the current approach to environmental modeling. This report presents the design of the framework for developing a comprehensive modeling system (CMS) for air pollution. This system would provide a platform for modeling pollutant emissions, atmospheric physics and chemistry, and the impact of pollution. The system would also provide a readily accessible interface, a powerful set of analysis and decision support tools, and a method to make maximum use of available computational resources.

BACKGROUND: Air quality models currently address a variety of environmental issues such as emission permitting, ozone control, acid deposition, particulate matter, air toxics, emergency planning and response, human exposure, and risk assessment. Each issue is treated with different sets of modeling tools of varying levels of scientific detail and complexity. The benefits of the CMS would be multifold: the latest scientific models would be available, the user-friendly system interface would greatly increase the number of potential users and their access to more sophisticated modeling tools, policy decisions would be based on the latest science, and the costs of model applications would be greatly reduced. This project, sponsored by the Consortium for Advanced Modeling of Regional Air Quality (CAMRAQ), presents the framework for CMS development.

OBJECTIVE: o To create a tool for system-assisted, user-friendly use of advanced air quality models in order to facilitate application of the best science in regulatory decisions. o To provide a software platform for the application and incorporation of the most advanced air pollution models.

APPROACH: In designing a framework for the CMS, the project team took into account users' needs, both those explicitly mentioned in a user survey conducted at the beginning of this project and ones dictated by experience and expectations. The ultimate CMS would be developed through a series of increasingly comprehensive prototypes. Particular attention would be paid to the mechanisms the framework provides for rapid adaptation to changes in user requirements and methods, transitions in regulatory mandates, and the explosive growth in computational technologies.

RESULTS: This report provides design, implementation, and management plans for the CMS. By design, users would access the CMS system through a standard graphical user interface (GUI), which would include visualization software for displaying two- and three-dimensional representations of input and output data. The interface would also include geographic information system (GIS) capabilities for accessing and displaying data according to geographical location. Powerful statistical packages would be available for summarizing, synthesizing, and analyzing data as well as extensive on-line help files to minimize or avoid reliance on operator's manuals. The fully developed CMS would be accessible from the user's workplace through a Unix workstation or PC-based computer interface. The GUI would allow the user to point and click with a mouse to select a model configuration (emissions, meteorological, dispersion, or air quality) consistent with the intended application. If desired, the user could also select individual modules (preprocessors, chemical mechanism, boundary layer treatment, advection scheme) other than the default set. Having configured the model, the user could then select the geographic domain and time period. Finally, the user could choose the corresponding emissions, meteorology, air quality, topography, land use, and demographic data, often from a geographically distributed archive via the Internet.

EPRI PERSPECTIVE: The existing infrastructure and technology for developing, evaluating, and applying regional air quality models present a multitude of difficulties and obstacles to their convenient use. The realism of their simulations is generally ill-defined. Their inner workings are opaque. The breadth of the issues they address is narrow. These and related problems could be significantly alleviated if a new paradigm for air quality modeling were established: Use a comprehensive modeling system

that explicitly takes into account existing impediments to reliable and efficient modeling. The CMS envisioned would provide emissions modeling, meteorological modeling, air quality modeling and characterization, decision support, and report preparation assistance. With software tools and hardware products that would place it at the cutting edge of computer and atmospheric sciences, the CMS would become the regulatory and research platform of choice for air quality modeling.

TECHNICAL INTEREST AREA: H3001 Air Quality

DESCRIPTORS: Air Quality; Air Quality Models; Computer Graphics; Computer Simulation; Environmental Models; Meteorological Models; Atmosphere

IDENTIFIERS: AIR QUALITY MANAGEMENT; CAMRAQ

38/5/27 (Item 3 from file: 241)

1060419 SUBFILE: EPRI TECHNICAL REPORT

Coal Quality Field Test at Watson Unit 4 of Mississippi Power Company

REPORT NUMBER: EPRI TR-105137 0256p.

CONTRACT/GRANT NO.: RP1400-25

DOCUMENT TYPE: Final Report

PUBLICATION YEAR: 1995 08

EPRI DIVISION NAME: Generation Group

EPRI PROJECT MANAGER: O'Connor, David

PERFORMING ORG.: Electric Power Technologies, Inc.

DATE ENTERED: 960326 DATE UPDATED: 970807

The cost and quality of coal significantly affects the cost of electricity. The Department of Energy and EPRI have jointly developed the Coal Quality Expert program, which uses the results of field tests to evaluate the impacts of coal switching on boiler performance and emissions. This report summarizes the results of field tests conducted at Mississippi Power Company's Watson Unit 4.

BACKGROUND: Many utilities have considered modifying purchase specifications to accommodate a wider range of coals, including lower-price, lower-quality coals. However, numerous trade-offs must be considered with alternate coals, such as a potential loss in boiler thermal efficiency, reduced generating capacity and availability, increased maintenance costs, and emissions risks. A common method for assessing the impacts of alternate coals involves conducting back-to-back test burns of current and alternate coals. Historically, the benefit of coal test burns has varied significantly due to differences in evaluation procedures and a lack of engineering correlations for predicting the impacts of coals with substantially different properties. In recent years, EPRI has supported a number of research projects to help utilities evaluate the impact of coal quality variations. Results from these projects are the basis for EPRI's Coal Quality Impact Model (CQIM(TM)), which predicts the net impact of coal quality on the cost of electricity.

OBJECTIVE: To evaluate the impacts of coal switching on boiler performance and emissions at Mississippi Power Company's Watson Unit 4; to validate the CQIM and acquire data to improve model correlations.

APPROACH: The project team conducted field tests at Watson Unit 4--a 255-MW opposed-wall, pulverized coal-fired boiler--to compare performance of an alternate coal with a base coal under similar operating conditions. The team used data from baseline tests to calibrate the CQIM, which helped predict the potential adverse coal quality impacts of the alternate coal. Finally, they demonstrated the application of EPRI's Fireside Testing Guidelines (CS-5552).

RESULTS: The approach recommended in the Fireside Testing Guidelines provided a suitable framework for a fair comparison of alternate and base coals. In terms of boiler performance, the alternate coal produced a sticky, liquid type of deposit that extensively covered the furnace walls. This ash was difficult to remove by sootblowers and tended to retard furnace heat transfer. In addition, the furnace exit gas temperature averaged 70 degrees Fahrenheit higher for the alternate coal than for the base coal, while the plant heat rate remained consistent for both coals.

SO2 emissions for the alternate coal measured approximately 5 percent higher, consistent with its higher sulfur content. NOx emissions versus excess O2 characteristics of the base and alternate coals were very similar and virtually indistinguishable within the normal range of data scatter. Due to equipment problems, particulate tests performed were inconclusive. CQIM predictions of Unit 4 performance with the test burn data for the alternate coal were within 5 percent for most boiler parameters such as net plant heat rate, fuel burn rate, economizer out temperature, and boiler efficiency. CQIM NOx predictions at the full load condition agreed fairly well with the test burn data, falling within 10 percent of average measured values. The CQIM runs did not address air in-leakage across components such as the electrostatic precipitator, ductwork, and boiler. Investigators recommended adding user inputs for in-leakage so that air and gas flows can be predicted. Furthermore, since the current mill models in CQIM do not adequately evaluate a ball tube mill such as the one used at Watson Unit 4, investigators concluded that a ball tube mill model should be developed.

EPRI PERSPECTIVE: The field test at Watson Unit 4 served multiple purposes. It offered a comprehensive application of EPRI's Fireside Testing Guidelines and a major validation effort for the CQIM. Several opportunities for improving unit performance were defined, equipment and instrumentation problems were identified, valuable experience was gained with a number of new measurement techniques, and a strong technical basis was established for future coal quality field tests and the valuation of coal procurement specifications.

TECHNICAL INTEREST AREA: F3002 Fossil Steam Plant Performance Optimization

DESCRIPTORS: Coal Quality; Coal Analysis; Fossil-Fuel Fired Boilers; Fossil-Fuel Power Plants; Testing; Cost Benefit Analysis

IDENTIFIERS: COAL QUALITY EXPERT PROGRAM; COAL QUALITY IMPACT MODEL; FIRESIDE TESTING

38/5/28 (Item 4 from file: 241)

1059330 SUBFILE: EPRI TECHNICAL REPORT

Coal Quality Field Test at Northeastern Unit 4 of Public Service Company of Oklahoma

REPORT NUMBER: EPRI TR-105565 0292p.

CONTRACT/GRANT NO.: RP1400-25

DOCUMENT TYPE: Final Report

PUBLICATION YEAR: 1995 10

EPRI DIVISION NAME: Generation Group

EPRI PROJECT MANAGER: O'Connor, David C.

PERFORMING ORG.: Electric Power Technologies, Inc.; Southern Research Institute; Energy Environmental Research Corp.; Southern Company Services, Inc.; Fossil Energy Research Corporation

DATE ENTERED: 951215 DATE UPDATED: 971121

The cost and quality of coal significantly affects the cost of electricity. The Department of Energy and EPRI have jointly developed the Coal Quality Expert program, which uses the results of field tests to evaluate the impacts of coal switching on boiler performance and emissions. This report summarizes the results of field tests conducted at Northeastern Unit 4 of Public Service Company of Oklahoma.

BACKGROUND: Many utilities have considered modifying purchase specifications to accommodate a wider range of coals, including lower-price, lower-quality coals. However, numerous trade-offs must be considered with alternate coals, such as a potential loss in boiler thermal efficiency, reduced generating capacity and availability, increased maintenance costs, and emissions risks. In recent years, EPRI has supported a number of research projects to help utilities evaluate the impact of coal quality variations. Results from these projects are the basis for EPRI's Coal Quality Impact Model (CQIM(TM)), which predicts the net impact of coal quality on the cost of electricity.

OBJECTIVE: To evaluate the impacts of coal switching on boiler performance and emissions at Northeastern Unit 4 of Public Service Company

of Oklahoma; to validate the CQIM and acquire data to improve model correlations.

APPROACH: The project team conducted field tests at Northeastern Unit 4--a 445-MW pulverized-coal-fired boiler--to compare performance of two coal blends (90% Wyoming/10% Oklahoma coal and a 70% Wyoming/30% Oklahoma coal) with a base 100% Wyoming coal under similar operating conditions. They performed measurements using EPRI's Fireside Testing Guidelines (CS-5552). In addition, they developed a new test procedure to identify critical operating conditions and monitor ash deposition by tracking the waterwall heat absorption decay rate; this procedure may be adapted for continuous application to boilers with chronic ash deposition problems. Finally, they used data from baseline tests to calibrate the CQIM, which helped predict the performance and potential adverse coal quality impacts of the coal blends.

RESULTS: The approach recommended in the Fireside Testing Guidelines provided a suitable framework for a fair comparison of coal blends and base coals. In terms of boiler performance, the blends exhibited a high-to-severe tendency to slag and foul the boiler. Thus, control of local thermal conditions inside the boiler as well as air in-leakage between the furnace and induced draft fan inlets is critical to controlling ash deposition with all coal blends. NOx emissions were characterized as a function of burner tilt for each coal blend, with minimum emissions measured at zero degree tilt. CQIM predictions of Unit 4 performance with the test burn data for the coal blends were within 5% for most boiler parameters such as net plant heat rate, fuel burn rate, furnace exit gas temperature, economizer outlet temperature, and boiler efficiency. The test burns provided valuable information for CQIM model development and unit calibration. CQIM predictions of outlet air temperature from the trisector air heaters agreed reasonably well with those measured during the test program. However, CQIM power predictions for primary air and forced draft fans were inconsistent due to simplistic assumptions for air leakage in trisector air heaters. This problem will be addressed in the next version of CQIM.

EPRI PERSPECTIVE: The field test at Northeastern Unit 4 served multiple purposes. It offered a comprehensive application of EPRI's Fireside Testing Guidelines and a major validation effort for the CQIM. Several opportunities for improving unit performance were defined, equipment and instrumentation problems were identified, valuable experience was gained with a number of new measurement techniques, and a strong technical basis was established for future coal quality field tests and the valuation of coal procurement specifications.

TECHNICAL INTEREST AREA: F3002 Fossil Steam Plant Performance Optimization

DESCRIPTORS: Coal Quality; Expert Systems; Impact; Testing

IDENTIFIERS: Coal Quality Expert Program; Coal Quality Impact Model; Fireside testing

38/5/29 (Item 5 from file: 241)

DIALOG(R)File 241:Elec. Power DB

1048666 EPRI ACCESSION NO: 2317500 SUBFILE: EPRI TECHNICAL REPORT

Analysis of Alternative SO2 Reduction Strategies

REPORT NUMBER: EPRI EN/GS-7132 0320p.

CONTRACT/GRANT NO.: RP2156-01

DOCUMENT TYPE: Final Report

PUBLICATION YEAR: 1991 01

EPRI DIVISION NAME: Environment Group

EPRI PROJECT MANAGER: Allan, Mary Ann

DATE ENTERED: 910619 DATE UPDATED: 970807

This report presents a comprehensive evaluation of the costs and environmental implications of two general strategies for reducing SO2 emissions over the period of 1991 to 2050. The retrofit strategy would require rapid reductions using a combination of fuel switching and retrofitting at existing power plants. The replacement strategy assumes an accelerated application of more-efficient technologies for repowering

existing units and for new construction.

BACKGROUND: Part of the debate about the Clean Air Act Amendments focused on a major reduction in yearly SO2 emissions. The driving force for this reduction was the concern that current levels of SO2 are detrimental to the environment and to human health. The economic costs of implementing emission reductions and the resulting environmental benefits are dependent upon the strategies used to meet such reductions.

OBJECTIVE: To compare two alternative strategies for SO2 emission reduction by evaluating the expected differences in their emissions, ambient concentrations and deposition, environmental and health benefits, and costs.

APPROACH: Using available data and mathematical models, researchers delineated two alternative SO2 reduction strategies. They investigated 10 different scenarios for each of the two strategies, covering a range of possible costs, SO2 emissions, and other combustion by-products and incorporating different electricity demand and technology assumptions. Using a single scenario for each of the two strategies, researchers then used the SO2 emissions projections to calculate ambient concentrations and depositions. These predicted environmental loadings were used to analyze potential effects on lakes, streams, forests, crops, human health, visibility, and materials. Results for the two strategies were then compared.

RESULTS: o The replacement strategy would be less costly than the retrofit strategy. o Between 1991 and 2025, emissions of SO2 would be less under the retrofit strategy compared with the replacement strategy. Beyond 2025, SO2 emissions from either strategy would be comparable. o Other environmentally significant by-products, including solid wastes and CO2 emissions, would be lower under the replacement strategy compared with the retrofit strategy. o No significant differences in long-term environmental effects are associated with differences in SO2 emissions between the two strategies. Some short-term differences are predicted for the first half of the evaluation period when the differences in SO2 emissions are greatest.

EPRI PERSPECTIVE: This analysis of SO2 emission, control, and environmental consequences is intended as a thoughtful approach to stewardship of our environment. It is appropriate to consider such emission control strategies in the light of our knowledge about the interdependence of environmental stresses. A fragmented approach to environmental protection may exacerbate other environmental stresses, as well as limit our national productivity by using capital resources in a less than optimal fashion. An integrated approach, such as the one used in this analysis, should be considered in other emission control/environmental protection issues.

TECHNICAL INTEREST AREA: E3001 Air Emissions Control

DESCRIPTORS: Comparative Evaluation; Sulfur Dioxide; Emission Control; Energy Demand Models; Environmental Models; Environmental Effects; Reduction

38/5/30 (Item 6 from file: 241)

DIALOG(R)File 241:Elec. Power DB

1033007 EPRI ACCESSION NO: 0652000 SUBFILE: EPRI TECHNICAL REPORT

Catalog of Data for the EPRI Plume Model Validation and Development Data Base: Moderately Complex Terrain Site

REPORT NUMBER: EPRI EA-3762 0140p.

CONTRACT/GRANT NO.: RP1616-09

DOCUMENT TYPE: Final Report

PUBLICATION YEAR: 1985 05

EPRI DIVISION NAME: Environment Group

EPRI PROJECT MANAGER: Mueller, Peter;Dr.

DATE ENTERED: 850725 DATE UPDATED: 990108

The PMV&D data base on power plant effluents in a hilly site contains an immense quantity of field measurements. This catalog quickly shows users the kinds of data archived for each variable and for each measurement hour.

BACKGROUND: The primary purpose of EPRI's extensive Plume Model Validation and Development (PMV&D) Project is to measure variables

pertinent to the natural dispersion of stack effluents from fossil fuel electric generating plants. These data will stand as benchmarks for the accuracy of plume-dispersion computer models used in the regulatory process. The study included measurement and data archiving for plants at a plains site, at a complex (mountainous) site, at an urban site, and at a moderately complex (hilly) site. The plains-site work is complete. Studies in the mountainous and urban settings are still in progress.

OBJECTIVE: To provide an index to the types of data measured at the moderately complex terrain site in EPRI's Plume Model Validation and Development Project.

APPROACH: This study recorded measurements on more than 50 source emissions, meteorologic, and air quality variables during two 4-week measurement periods at the Bull Run generating station in Tennessee in 1982. The station is a coal-fired, 950-MW baseload facility having a stack 800 ft high. Analysts checked all data for errors before analysis and archiving and used special software to screen the weekly files for data meeting the specified validity criteria. The archives contain 1340 hours of routine meteorologic measurements and 250 hours of intensive micrometeorologic and tracer data.

RESULTS: The catalog, which follows the organization of the extensive PMV&D data base for hilly terrain, affords users a way of screening the data before they enter the archive. As a reference document, the catalog indexes by week, day, and hour the variables for which valid measurements appear in the data base. In coded tables, users can easily determine the status of all archived data before they access the data base itself.

EPRI PERSPECTIVE: Since these data represent a unique and comprehensive set of measurements of tall stack plume behavior at a hilly site, they have value for research and planning well beyond the initial model validations they supported. This catalog will expedite their use. EPRI's PMV&D project has four major objectives: (1) evaluating the ability of plume models to predict the dispersion characteristics of stack effluents; (2) assessing model performance over a range of significant source, topological, and meteorologic conditions; (3) establishing a plume-behavior data base; and (4) developing and validating improved models. All 27 publications documenting the project so far are listed in each report.

TECHNICAL INTEREST AREA: H3001 Air Quality

DESCRIPTORS: Plume Models; Tracers; Databases; Data Compilation

38/5/31 (Item 7 from file: 241)

1030491 EPRI ACCESSION NO: 0392800 SUBFILE: EPRI TECHNICAL REPORT

Plume Model Validation and Development Field Measurements--Plains Site

REPORT NUMBER: EPRI EA-3064 0210p.

CONTRACT/GRANT NO.: RP1616-08

DOCUMENT TYPE: Final Report

PUBLICATION YEAR: 1984 02

EPRI DIVISION NAME: Environment Group

EPRI PROJECT MANAGER: Mueller, Peter;Dr.

DATE ENTERED: 840502 DATE UPDATED: 990108

Researchers have successfully completed field measurements for the flat terrain phase of the PMV&D project. Capture rates of source emission, aerometric, and meteorological data were high, yielding an excellent data base against which to validate existing and future plume-dispersion models.

BACKGROUND: In order to evaluate the validity and reliability of plume models used to measure stack emission dispersion from fossil-fuel-fired generating plants, comprehensive and accurate field measurements must be collected and analyzed. This task is a major part of EPRI's Plume Model Validation and Development (PMV&D) project, which is conducting measurements in three different terrains. This report describes measurements taken in flat (plains) terrain near the Kincaid Generating Station in central Illinois.

OBJECTIVE: To collect field data for validating and refining existing plume models and for developing and testing new models.

APPROACH: The field measurement program included routine and intensive

measurement periods of stack emissions from a power plant at the plains site. Measurements of source emissions--SO2, NOx, O2, and gas velocity--and various aerometric and meteorological parameters were made from March 1980 to June 1981. Intensive measurements, conducted in three 3-week periods, covered all routine measurements, aircraft measurements of source emissions, turbulence, temperature, dew point, and supplemental source emission and meteorological factors. Monitoring data were also obtained for various routine and intensive measurement periods.

RESULTS: o The field program acquired routine and intensive measurement data over a total period of 5300 hours. o Because source emission measurement is so critical in validating models, researchers tried to maximize the data capture of source parameters, particularly during intensive measurement periods. The resulting capture rate of source emission data was 90% or greater for all parameters except gas velocity. The gas velocity monitor failed completely, so all reported velocities were computed from plant megawatt data and oxygen and temperature measurements. These calculated data, however, had a capture rate of 98% or better. o Data capture for most routine aerometric and meteorological measurements was above 80%, and tracer measurements covered 375 hours of a planned 450-hour period. o A few adjustments were made during the 1980-81 measurement period to correct problems in wind and total suspended particulate (TSP) data. There were wind data from at least one monitoring station for 87% of the 1980 study period. Software changes, which were made later that year to identify inadequate data, improved wind data capture in 1981 to 93%. The capture rate of TSP data for 1980 was low--about 47%--because of instrument problems and interference from birds nesting in the samplers. Installing nets over the samplers increased the capture rate of TSP data to 72% in 1981. o System and performance audits documented experimental errors, which ranged from 0 to 20%, depending on the type of measurement.

EPRI PERSPECTIVE: The field measurements described in this report were subsequently used to validate three Gaussian plume models (EPRI report EA-3076) and to evaluate three first-order closure models (EPRI report EA-3078) and one second-order closure model (EPRI report EA-3079). Altogether, 19 reports have been published on the PMV&D project. Field measurements at the hilly site, which is the second phase of the project, are complete, and the model validation results will be available by mid-1984.

TECHNICAL INTEREST AREA: H3001 Air Quality
DESCRIPTORS: Plume Models; Tracer Techniques; Sulfur Dioxide
IDENTIFIERS: Atmospheric Diffusion

38/5/32 (Item 1 from file: 103)

04704472 EDB-01-053716
Title: Comprehensive **PM[sub 10]** emission **inventories, dispersion** modelling **and population exposure for Switzerland**
Author(s): Haan, P. de; Heldstab, J. (INFRAS, Bern (Switzerland)); Filliger, P. (Swiss Agency for the Environment, Forests and Landscape, Bern (Switzerland)); Kunzle, T. (METEOTEST, Bern (Switzerland))
Title: Transport and air pollution
Original Title: Transport et pollution de l'air
Corporate Source: Institut National de Recherche sur les Transports et leur Securite (INRETS), 75 - Paris (France)
Conference Title: 9. symposium on transport and air pollution
Conference Location: Avignon (France) Conference Date: 2000
Publisher: Paris (France) Institut National de Recherche sur les Transports et leur Securite - INRETS
Publication Date: 2000
p 175-182 (596 p)
ISBN: 2-85782-533-1
Note: 4 refs.
Document Type: Analytic of a Book; Conference Literature
Language: English
Journal Announcement: EDB0112

Subfile: ETD (Energy Technology Data Exchange). FR (France (sent to DOE from))
Country of Origin: France
Country of Publication: France
Abstract: The new Swiss PM[sub 10] model simulates particles from primary PM[sub 10] emissions, secondary aerosols from precursor concentrations and regional PM[sub 10] components due to emissions from surrounding European countries. The model is implemented in a geographical information system. Results for 1997 of the first model version show that a large area of the Swiss Plateau, with most (sub-)urban locations, have concentration values above the ambient air quality standard of 20 [mu]g m[sup -3]. Since mainly the built-up area is concerned, 61 % of the inhabitants (4.3 million of persons) live within the area of excessive PM[sub 10] pollution levels. The model results are already used as a tool for regional air pollution management. The second version of the model, to be completed in the year 2000, will introduce separate modeling of PM[sub 10] and PM[sub 2.5] concentrations, new emission factors for road transport and a revised dispersion model. (authors)
Descriptors: SWITZERLAND; PUBLIC HEALTH; TOTAL SUSPENDED PARTICULATES; COMPUTERIZED SIMULATION; AEROSOL MONITORING; URBAN AREAS; ROAD TRANSPORT; MAXIMUM PERMISSIBLE EXPOSURE; VALIDATION; EXHAUST GASES
Broader Terms: DEVELOPED COUNTRIES; WESTERN EUROPE; PARTICULATES; SIMULATION; AIR POLLUTION MONITORING; LAND TRANSPORT; SAFETY STANDARDS; TESTING; GASEOUS WASTES; GASES; EUROPE; PARTICLES; MONITORING; TRANSPORT; STANDARDS; WASTES; FLUIDS
INIS Subject Categories: S54
F

38/5/33 (Item 2 from file: 103)
DIALOG(R)File 103:Energy SciTec

04500943 FRC-99-006180; EDB-99-081622
Title: NaOH volatilization and particulate emission predictions as a function of pull rate in an oxy-fuel fired glass tank
Original Title: Volatilisation de NaOH et previsions d'emissions de particules en fonction de la tiree dans un four de verre en oxy-combustion
Author(s): Jurcik, B.; Schnepper, C. (American Air Liquide (United States)); Perrin, V. (Air Liquide Gaz Industriels Services (France))
Source: Industrie Ceramique v 947. Coden: IDCQAX ISSN: 0019-9044
Publication Date: Jun 1999
p 231-233
Document Type: Journal Article
Language: English; French
Journal Announcement: EDB9918
Subfile: ETD (Energy Technology Data Exchange). FR (France (sent to DOE from))
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: France
Abstract: The effects of different pull rates on the glass melt, firing and emissions rates are of interest to glass manufacturers. While a great deal of manufacturing experience exists that describes the historical functionality of these variables it is not always possible to translate experiences from one tank to another. This effect is even more in evidence when comparing an oxy-fuel fired glass tank to an air fired glass tank. As a result, mathematical models have been developed to predict the effect of operating conditions on process variables. At Air Liquide, mathematical modeling is one of the tools available for studying the effect of operating conditions on such variables as the firing and emissions rate from glass tanks. Two codes are used for the simulation. They are coupled to give a complete description of the thermal and fluid dynamic characteristics of the glass tank. While the fluid dynamic and thermal characteristics of the glass tank are of

interest, the translation of these results into concrete process data such as particulate emissions requires an integration of the results to give a single numerical result. A **comprehensive** particulate **emissions model** was developed that takes into account volatilization from the glass/batch surface and carryover (saltation) of the raw batch material. This model predicts the volatilization rate of NaOH from the glass/batch surface from the temperatures and velocities results from the coupled calculation results. The maximum diameter of solid particle that can be resuspended into the gas flow is also calculated which can give an indication of areas of high carryover. The saltation model does not take into account the degree of sintering or degree of melting within the batch blanket so that the total amount of carryover can not be predicted. An interesting application of the particulate emissions model was to evaluate the effect of the pull rate on the particulate emissions in an oxy-fuel fired glass tank. This application is described into details 4 refs.

Descriptors: AIR POLLUTION CONTROL; COMBUSTION; EVAPORATION; GLASS INDUSTRY ; MATHEMATICAL MODELS; OXYGEN; PARTICULATES; SODIUM HYDROXIDES

Broader Terms: ALKALI METAL COMPOUNDS; CHEMICAL REACTIONS; CONTROL; ELEMENTS; HYDROGEN COMPOUNDS; HYDROXIDES; INDUSTRY; NONMETALS; OXIDATION; OXYGEN COMPOUNDS; PARTICLES; PHASE TRANSFORMATIONS; POLLUTION CONTROL; SODIUM COMPOUNDS; THERMOCHEMICAL PROCESSES

Subject Categories: 540120* -- Environment, Atmospheric -- Chemicals Monitoring & Transport -- (1990-)

38/5/34 (Item 3 from file: 103)

DIALOG(R)File 103:Energy SciTec

04305306 EDB-98-065721

Title: Scaling laws for NO[sub x] emission performance of burners and furnaces from 30 kW to 12 MW

Author(s): Hsieh, T.C.A.; Dahm, W.J.A.; Driscoll, J.F. (Univ. of Michigan, Ann Arbor, MI (United States))

Source: Combustion and Flame v 114:1-2. Coden: CBFMAO ISSN: 0010-2180
Publication Date: Jul 1998
p 54-80
Document Type: Journal Article
Language: English
Journal Announcement: EDB9814
Subfile: ETD (Energy Technology Data Exchange). IMS (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States

Abstract: A general analytical approach for scaling NO[sub x] emissions from burners and furnaces is presented, together with the scaling model for NO[sub x] emissions performance that results when this approach is applied to a broad class of swirl-stabilized industrial gas burners. The model is based on results from a set of collaborative burner scaling experiments on a generic gas burner and furnace design at five different scales having near-uniform geometric, aerodynamic, and thermal similarity and uniform measurement protocols. This collaborative effort provides the first NO[sub x] scaling data over the range of thermal scales from 30 kW to 12 MW, including input-output measurements as well as detailed in-flame measurements of NO, NO[sub 2], CO, O[sub 2], unburned hydrocarbons, temperature, and velocities at each scale. The in-flame measurements allow identification of key sources of NO[sub x] production. The underlying physics of these NO[sub x] sources lead to scaling laws for their respective contributions to the overall NO[sub x] emissions performance. It is found that the relative importance of each source depends on the burner scale and operating conditions. The scalings for these NO[sub x] sources are combined in a **comprehensive** scaling **model** for NO[sub x] **emission** performance. Results from the scaling model show good agreement with experimental data at all burner scales and over the entire range of turndown, staging, preheat, and excess air dilution, with correlations

generally exceeding 90%. The scaling model permits design trade-off assessments for a broad class of burners and furnaces, and allows performance of full industrial-scale burners and furnaces of this type to be inferred from results of small-scale tests.
Descriptors: CHEMICAL REACTION YIELD; COMBUSTION KINETICS; GAS BURNERS; GAS FUELS; GAS FURNACES; MATHEMATICAL MODELS; NITROGEN OXIDES; PERFORMANCE; SCALING LAWS
Broader Terms: BURNERS; CHALCOGENIDES; CHEMICAL REACTION KINETICS; FUELS; FURNACES; KINETICS; NITROGEN COMPOUNDS; OXIDES; OXYGEN COMPOUNDS; REACTION KINETICS; YIELDS
Subject Categories: 030700* -- Natural Gas -- Waste Management
034000 -- Natural Gas -- Combustion

38/5/35 (Item 4 from file: 103)
DIALOG(R)File 103:Energy SciTec

04285214 EDB-98-045629
Title: Update of national ozone study: Where are we now
Author(s): Mathur, B.
Title: Energy and environment in the marketplace. Proceedings of the twenty-fourth annual Illinois energy conference
Corporate Source: Illinois Univ., Chicago, IL (United States). Energy Resources Center
Conference Title: 24. annual Illinois energy conference
Conference Location: Chicago, IL (United States) Conference Date: 15 Nov 1996
Publisher: Chicago, IL (United States) Univ. of Illinois
Publication Date: 1996
p 17-52 (304 p)
Report Number(s): CONF-9611132--Proc.
Order Number: DE98000112
Document Type: Analytic of a Book; Conference Literature
Language: English
Journal Announcement: EDB9811
Availability: OSTI; NTIS; Energy Resources Center M/C 156, The University of Illinois at Chicago, 851 South Morgan Street, Chicago, IL 60607-7054 (United States)
Subfile: ETD (Energy Technology Data Exchange). IIA (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: This paper is one of three keynote presentations given at the conference. It addresses the issue of national ozone research in focusing on the regional task force, Ozone Transport Assessment Group (OTAG). The overall objectives of the OTAG initiatives are reported. These include development of a **comprehensive** regional **emissions** inventory, selection of research **models** and protocols, identification of criteria for selecting emissions control strategies, and development of a framework for a NO[sub x] trading system. Findings from preliminary modeling runs and analyses are presented. 15 figs., 15 tabs.
Descriptors: ENVIRONMENTAL TRANSPORT; NITROUS OXIDE; OZONE; RESEARCH PROGRAMS; US EPA
Broader Terms: CHALCOGENIDES; MASS TRANSFER; NATIONAL ORGANIZATIONS; NITROGEN COMPOUNDS; NITROGEN OXIDES; OXIDES; OXYGEN COMPOUNDS; US ORGANIZATIONS
Subject Categories: 540120* -- Environment, Atmospheric -- Chemicals Monitoring & Transport -- (1990-)

38/5/36 (Item 5 from file: 103)
DIALOG(R)File 103:Energy SciTec

04242736 GRA-97-21650; EDB-98-003152; EDB-98-003151

Title: Effects of transportation on energy and air quality. Transportation research record
Corporate Source: National Research Council, Washington, DC (United States). Transportation Research Board (Code: 9508030)
Publication Date: 1997
(144 p)
Report Number(s): PB-98-104672/XAB TRB/TRR--1587
Document Type: Report
Language: English
Journal Announcement: EDB9801
Availability: NTIS
Distribution: (Report):9 (MF):6 ND-00
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange). GRA (NTIS NTS)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Partial Contents: Alternative Fuel Vehicle Programs: Applicability of Government Incentives; Transitional Alternative Fuels and Vehicles Model; Forecasting Cost Path of Electric Vehicle Drive System: Monte Carlo Experience Curve Simulation; Another Way to Go. Some Implications of Light-duty Diesel Strategy; Use of Episodic Controls to Reduce Frequency and Severity of Air Pollution Events; Conformity: Long-Term Prognoses for Selected Ozone Nonattainment Areas in California; Development of **Comprehensive** Modal **Emissions Model** : Operating Under Hot-Stabilized Conditions; and Implications of Transient Mode Duration for Spatially Disaggregated High-Resolution Emission Inventory Studies.
Descriptors: AIR POLLUTION ABATEMENT; AIR POLLUTION MONITORING; TRANSPORTATION SECTOR
Broader Terms: MONITORING; POLLUTION ABATEMENT
Subject Categories: 540120* -- Environment, Atmospheric -- Chemicals Monitoring & Transport -- (1990-)

38/5/38 (Item 7 from file: 103)
DIALOG(R)File 103:Energy SciTec

03684262 EDB-94-100228
Title: Optimal SO[sub 2] compliance planning using probabilistic production costing and generalized benders decomposition
Author(s): Huang, Wenxiong (Energy Management Associates, Inc., Atlanta, GA (United States)); Hobbs, B.F. (Case Western Reserve Univ., Cleveland, OH (United States). Dept. of Systems Engineering)
Source: IEEE Transactions on Power Systems (Institute of Electrical and Electronics Engineers) (United States) v 9:1. Coden: ITPSEG ISSN: 0885-8950
Publication Date: Feb 1994
p 174-180
Document Type: Journal Article
Language: English
Journal Announcement: EDB9415
Subfile: ETD (Energy Technology Data Exchange). IMS (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: In 1990, the US Congress a new Clean Air Act which contains provisions to control sulfur dioxide (SO[sub 2], a primary cause of acid rain) emitted from electric generation plants in the US. Under this Act, electric utilities will be able to choose from a wide range of SO[sub 2] **emissions** control measures. This paper presents a **comprehensive emissions** control **model** which can systematically examine all available emissions control options and construction optimal compliance plan. The model is a nonlinear integer program that uses probabilistic production costing to simulate system generation. A solution procedure based on Generalized Benders Decomposition (GBD) is

developed, exploiting the special structure of the problem formulation. The GBD solution procedure employs an efficient method to calculate the derivatives of the expected generation of a unit with respect to the capacity of another unit. The model is applied to a utility system to construct least-cost compliance strategies under a range of prices of allowances. The model can also be used to derive a supply curve for emissions reductions that accounts for emissions dispatch and interactions among control options.
Major Descriptors: *POWER SYSTEMS -- ECONOMICS; *SULFUR DIOXIDE -- AIR POLLUTION CONTROL
Descriptors: DECISION MAKING; PLANNING
Broader Terms: CHALCOGENIDES; CONTROL; ENERGY SYSTEMS; OXIDES; OXYGEN COMPOUNDS; POLLUTION CONTROL; SULFUR COMPOUNDS; SULFUR OXIDES
Subject Categories: 240100* -- Power Systems -- (1990-)
200202 -- Fossil-Fueled Power Plants -- Waste Management -- Noxious Gas & Particulate Emissions

38/5/39 (Item 8 from file: 103)
DIALOG(R)File 103:Energy SciTec

03591978 EDB-94-007944
Title: Development of the base year UAM modeling emission inventories for the Louisville, Kentucky ozone SIP attainment demonstration
Author(s): Gardner, L.; Tunggal, H.H.; Reid, S.B.; Irwin, K.T.; Jackson, R.E.; Haney, J.L.
Title: Air Waste Management Association 86th annual meeting exhibition
Conference Title: 86. annual meeting and exhibition of the Air and Waste Management Association (AWMA)
Conference Location: Denver, CO (United States) Conference Date: 13-18 Jun 1993
Publisher: Pittsburgh, PA (United States) Air Waste Management Association
Publication Date: 1993
p 54 (363 p)
Report Number(s): CONF-930647--
Document Type: Analytic of a Book; Conference Literature
Language: English
Journal Announcement: EDB9401
Availability: Air Waste Management Association, P.O. Box 2861, Pittsburgh, PA 15230 (United States)
Subfile: EPA (Energy Abstracts for Policy Analysis); ETD (Energy Technology Data Exchange). IIA (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Due to continuing violations of the National Ambient Air Quality Standard (NAAQS) for ozone in the Louisville area of Kentucky and adjacent areas in Indiana, these areas have been designated as a [open quotes]multistate moderate[close quotes] ozone nonattainment area by the EPA Under the 1990 Clean Air Act Amendments, areas so designated must perform photochemical modeling as part of the required ozone State Implementation Plan (SIP) attainment strategy. In response to this requirement, the Jefferson County Air Pollution Control District (JCAPCD), which has assumed lead responsibility for the SIP submittal for the Louisville nonattainment area, is conducting a photochemical modeling application using the Urban Airshed Model (UAM). to assist in the development of the meteorological, air quality, and emissions data required for UAM modeling, JCAPCD has retained the services of Systems Applications International (SAI). This paper describes the preparation of the base year UAM modeling emission inventories developed for this application, and addresses the following: incorporation of data from four agencies (JCAPCD, the Kentucky Department for Environmental Protection, the Indiana Department of Environmental Management, and the Kentuckiana Planning and Development Agency) into a single, **comprehensive modeling emissions** database; spatial and temporal

allocation techniques; incorporation of source-specific speciated hydrocarbon emissions data; and development of biogenic emissions estimates.
Major Descriptors: *PHOTOCHEMICAL REACTIONS -- MATHEMATICAL MODELS; *POLLUTION REGULATIONS -- VIOLATIONS; *URBAN AREAS -- AIR QUALITY
Descriptors: AIR POLLUTION CONTROL; DATA; DATA BASE MANAGEMENT; EMISSION; HYDROCARBONS; IMPLEMENTATION; INDIANA; KENTUCKY; OZONE
Broader Terms: CHEMICAL REACTIONS; CONTROL; DEVELOPED COUNTRIES; ENVIRONMENTAL QUALITY; INFORMATION; MANAGEMENT; NORTH AMERICA; ORGANIC COMPOUNDS; POLLUTION CONTROL; REGULATIONS; USA
Subject Categories: 540120* -- Environment, Atmospheric -- Chemicals Monitoring & Transport -- (1990-)
290300 -- Energy Planning & Policy -- Environment, Health, & Safety

38/5/40 (Item 9 from file: 103)
DIALOG(R)File 103:Energy SciTec

03249818 GRA-91-92126; EDB-92-012575
Title: Status and needs for toxic-emission inventories for regional dispersion and deposition modeling
Author(s)/Editor(s): Benjey, W.G.
Corporate Source: Environmental Protection Agency, Research Triangle Park, NC (United States). Atmospheric Research and Exposure Assessment Lab. (Code: 9525887)
Publication Date: 1991
(15 p)
Report Number(s): PB-92-110394/XAB
Note: Presented at the EPA/AWMA International Specialty Conference on Emission Inventory Issues in the 1990s, Durham, NC., September 9-12, 1991. Prepared in cooperation with National Oceanic and Atmospheric Administration, Research Triangle Park, NC. Air Resources Lab.
Document Type: Report
Language: In English
Journal Announcement: EDB9202
Availability: NTIS
Distribution: (Report):9 (MF):6 ND-00
Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange). GRA (NTIS NTS)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: Title III of the Clean Air Act Amendments of 1990 established several new study and regulatory requirements for toxic air pollutants that make dispersion and deposition **modeling** and the associated toxic **emission** inventories necessary. There are currently no **comprehensive** regional **emission** inventories compiled with the purpose of regional dispersion modeling of toxic emissions. Limited emission inventories have or are being compiled although not necessarily for the purpose of modeling. There are useful databases from which information can be extracted to construct interim regional toxic emission inventories. In the long-term, basic information on toxics and improved inventory methodologies are needed to create inventories sufficient to drive sophisticated models. These needs may be summarized as: (1) improved toxic speciation and emission factors and application techniques; (2) improved knowledge of the atmospheric chemistry of toxic emissions; and (3) intergovernmental coordination in compiling emission inventories and in conducting research on toxic chemicals.
Major Descriptors: *AIR POLLUTION -- ENVIRONMENTAL TRANSPORT; *ENVIRONMENTAL TRANSPORT -- MATHEMATICAL MODELS; *US CLEAN AIR ACT -- COMPLIANCE
Descriptors: AIR POLLUTION MONITORING; INVENTORIES; TOXIC MATERIALS
Broader Terms: LAWS; MASS TRANSFER; MATERIALS; MONITORING; POLLUTION; POLLUTION LAWS
Subject Categories: 540120* -- Environment, Atmospheric -- Chemicals Monitoring & Transport -- (1990-)

38/5/41 (Item 10 from file: 103)
DIALOG(R)File 103:Energy SciTec

02966757 EDB-91-000382
Title: The study of a coal flame by FT-IR emission **/transmission tomography and** comprehensive modeling
Author(s): Solomon, P.R.; Markham, J.R.; Zhang, Y.P.; Carangelo, R.M. (Advanced Fuel Research Inc., Hartford, CT (USA)); Brewster, B.S.; Smoot, L.D. (Brigham Young Univ., Provo, UT (USA))
Title: American Chemical Society. Division of Fuel Chemistry
Conference Title: 200. American Chemical Society national meeting
Conference Location: Washington, DC (USA) Conference Date: 26-31 Aug 1990
Publisher: Washington, DC (US) American Chemical Society
Publication Date: 1990
p 9, Paper FUEL 28 (34 p)
Report Number(s): CONF-900802--
Document Type: Analytic of a Book; Conference Literature
Language: In English
Journal Announcement: EDB9101
Subfile: ETD (Energy Technology Data Exchange). JMT (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The objectives of this study are to elucidate the mechanisms of the ignition and combustion of coal and to develop a computer code to accurately describe these processes. The measurements employ Fourier Transform Infrared (FT-IR) Emission and Transmission (E/T) spectroscopy. Tomographic reconstruction techniques have been applied to line-of-sight measurements to derive spectra that correspond to small volumes within the flame. From these spectra, spatially resolved values for species temperature and relative concentrations can be determined. The technique was used to study the combustion of coal burned in a transparent wall reactor. The spectroscopic data are in good agreement with visual observations and thermocouple measurements.
Major Descriptors: *COAL -- COMBUSTION
Descriptors: COMPUTER CODES; FLAMES; IGNITION; SPECTROSCOPY; TOMOGRAPHY
Broader Terms: CARBONACEOUS MATERIALS; CHEMICAL REACTIONS; DIAGNOSTIC TECHNIQUES; ENERGY SOURCES; FOSSIL FUELS; FUELS; MATERIALS; OXIDATION; THERMOCHEMICAL PROCESSES
Subject Categories: 014000* -- Coal, Lignite, & Peat -- Combustion

38/5/42 (Item 11 from file: 103)
DIALOG(R)File 103:Energy SciTec

02388024 EDB-89-133999
Title: Characterization of the atmospheric pathway at hazardous waste sites
Author(s): Droppo, J.G. Jr.; Buck, J.W.
Affiliation: Pacific Northwest Lab., Richland, WA (USA)
Title: 1988 DOE model conference proceedings. Volume 4
Corporate Source: Analysas Corp., Oak Ridge, TN (USA)
Conference Title: 4. annual DOE model conference
Conference Location: Oak Ridge, TN, USA Conference Date: 3-7 Oct 1988
Publication Date: 1988
p 1177-1188
Report Number(s): CONF-881054-Vol.4
Order Number: DE89014703
Contract Number (DOE): AC06-76RL01830
Note: Portions of this document are illegible in microfiche products
Document Type: Analytic of a Report; Conference literature
Language: English
Journal Announcement: EDB8900
Availability: NTIS, PC A15/MF A01; 1.

Subfile: ERA (Energy Research Abstracts); ETD (Energy Technology Data Exchange); INS (US Atomindex input). JMT (DOE contractor)
Country of Origin: United States
Country of Publication: United States
Abstract: Evaluation of potential health effects for populations surrounding hazardous waste sites requires consideration of all potential contaminant transport pathways through groundwater, surface water, and the atmosphere. A **comprehensive** atmospheric pathway **model** that includes **emission** , dispersion, and deposition computations has been developed as a component of the Remedial Action Priority System (RAPS). RAPS is designed to assess the relative potential risks associated with hazardous and radioactive mixed-waste disposal sites. The atmospheric component includes optional volatilization and suspension emission routines. Atmospheric transport, dispersion, and deposition are computed using relatively standard modeling techniques expanded to incorporate topographical influences. This sector-averaged Gaussian model accounts for local channeling, terrain heights, and terrain roughness effects. Long-term total deposition is computed for the terrain surrounding the hazardous waste site. An example is given of applications at a US Department of Energy site, where atmospheric emissions are potentially important. The multiple applications of RAPS have provided information on the relative importance of different constituent transport pathways from a potential population risk basis. The authors results show that the atmospheric pathway is often equally as important as other pathways such as groundwater and direct soil ingestion.
Major Descriptors: *HAZARDOUS MATERIALS -- AIR POLLUTION; *HAZARDOUS MATERIALS -- ENVIRONMENTAL EXPOSURE PATHWAY; *HAZARDOUS MATERIALS -- GROUND DISPOSAL; *RADIOACTIVE WASTES -- AIR POLLUTION; *RADIOACTIVE WASTES -- ENVIRONMENTAL EXPOSURE PATHWAY
Descriptors: DEPOSITION; MATHEMATICAL MODELS; REMEDIAL ACTION; RISK ASSESSMENT; US DOE
Broader Terms: MANAGEMENT; MATERIALS; NATIONAL ORGANIZATIONS; POLLUTION; RADIOACTIVE MATERIALS; US ORGANIZATIONS; WASTE DISPOSAL; WASTE MANAGEMENT; WASTES
Subject Categories: 500200* -- Environment, Atmospheric -- Chemicals Monitoring & Transport -- (-1989)
500300 -- Environment, Atmospheric -- Radioactive Materials Monitoring & Transport -- (-1989)
INIS Subject Categories: C5230* -- Environmental aspects of chemical & thermal effluent from existing nuclear installations
B3310 -- Radioactive materials monitoring & transport; meteorology

38/5/45 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6663441 INSPEC Abstract Number: B2000-09-2350D-049
Title: Secondary electron emission modeling for simulated multi-stage depressed collector operation using MICHELLE
Author(s): Dionne, N.J.; Petillo, J.
Author Affiliation: Raytheon Co., Sudbury, MA, USA
Conference Title: Abstracts. International Vacuum Electronics Conference 2000 (Cat. No.00EX392) p.2 pp.
Publisher: IEEE, Piscataway, NJ, USA
Publication Date: 2000 Country of Publication: USA xix+364 pp.
ISBN: 0 7803 5987 9 Material Identity Number: XX-2000-01247
Conference Title: Abstracts. International Vacuum Electronics Conference 2000
Conference Sponsor: IEEE Electron Devices Soc
Conference Date: 2-4 May 2000 Conference Location: Monterey, CA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P)
Abstract: Electron beam collection systems variously employed in O-type fast-wave and slow-wave devices such as gyrotrons, gyroklystrons, klystrons, and TWTs must often be carefully designed to avoid potentially

undesirable consequences of secondary electron production at electrode surfaces. Some high performance device applications may experience added noise power resulting from secondary electron current returning to the RF interaction space. In high average power slow-wave devices, this returned current might contribute intolerable levels of additional thermal dissipation power on thermally stressed RF circuit structures. For more efficient operation of the amplifier system, multiple electrode geometries, set at prescribed "depressed" voltages, are often used to recover energy from "spent" beams exiting from the RF interaction space. However, the emission of secondary particle currents can alter the expected efficiency improvements by refocusing and redistributing the collected currents toward electrodes with the higher potential values, producing additional thermal stress in the process. An advanced, three-dimensional electron beam design tool, called MICHELLE, is currently undergoing development by a team lead by SAIC under ONR sponsorship. As part of this new effort, an algorithmic representation of a **comprehensive model** of secondary **emission** is being developed for this computational tool in order to achieve an accurate beam collection design capability. (0 Refs)

Subfile: B

Descriptors: klystrons; secondary electron emission; slow wave structures ; travelling wave tubes

Identifiers: secondary electron emission modeling; simulated multi-stage depressed collector operation; MICHELLE; electron beam collection systems; O-type fast-wave; slow-wave devices; gyrotrons; gyroklystrons; klystrons; TWT; noise power; RF interaction space; high average power slow-wave devices; returned current; thermal dissipation power; thermally stressed RF circuit structures; multiple electrode geometries; three-dimensional electron beam design tool; algorithmic representation; comprehensive model

Class Codes: B2350D (Travelling wave tubes); B2350 (Microwave tubes); B2320 (Electron emission, materials and cathodes)

38/5/46 (Item 2 from file: 2)

DIALOG(R)File 2:INSPEC

6663416 INSPEC Abstract Number: B2000-09-2350-043, C2000-09-7410D-060

Title: The new 3D electron gun and collector modeling tool: MICHELLE

Author(s): Petillo, J.; Blanchard, P.; Mondelli, A.; Eppley, K.; Krueger, W.; McClure, T.; Panagos, D.; Levush, B.; Burdette, J.; Cattelino, M.; DeFord, J.; Dionne, N.; Humphries, S., Jr.; Nelson, E.M.; True, R.

Author Affiliation: SAIC, Burlington, MA, USA

Conference Title: Abstracts. International Vacuum Electronics Conference 2000 (Cat. No.00EX392) p.2 pp.

Publisher: IEEE, Piscataway, NJ, USA

Publication Date: 2000 Country of Publication: USA xix+364 pp.

ISBN: 0 7803 5987 9 Material Identity Number: XX-2000-01247

Conference Title: Abstracts. International Vacuum Electronics Conference 2000

Conference Sponsor: IEEE Electron Devices Soc

Conference Date: 2-4 May 2000 Conference Location: Monterey, CA, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Applications (A); Practical (P); Experimental (X)

Abstract: A new 3D finite-element gun and collector modeling code, MICHELLE, is under development at SAIC in collaboration with industrial partners and national laboratories. This development program has been designed specifically to address the shortcomings of current beam optics simulation and modeling tools for vacuum electron devices. The program specifically targets problem classes including gridded-guns, sheet-beam guns, multi-beam devices, and anisotropic collectors. In particular, although there are 3D gun codes that exist today, their ability to address fine scale features is somewhat limited in 3D due to disparate length scales found in certain classes of devices. Additionally, features like advanced emission **models** , including thermionic Child's law and **comprehensive** secondary **emission models** also need attention for detailed modeling, and are included in the code. As part of this new

effort, an algorithmic representation of a **comprehensive model** of secondary **emission** is being developed for this computational tool in order to achieve an accurate beam collection design capability. The basic physics model in the code is based on the equilibrium steady state application of the electrostatic PIC approximation employing both hexahedral and tetrahedral grid systems. (0 Refs)

Subfile: B C

Descriptors: digital simulation; electron guns; millimetre wave tubes; secondary electron emission

Identifiers: 3D modelling; collector modeling tool; MICHELLE; SAIC; gridded-guns; sheet-beam guns; multi-beam devices; anisotropic collectors; fine scale features; secondary emission models; beam collection design; equilibrium steady state application; tetrahedral grid systems; hexahedral grid systems; mm-wave tubes; electron gun modeling

Class Codes: B2350 (Microwave tubes); B2320 (Electron emission, materials and cathodes); C7410D (Electronic engineering computing)

38/5/47 (Item 3 from file: 2)

DIALOG(R)File 2:INSPEC

03797763 INSPEC Abstract Number: A91016754

Title: Impulse generation by superintense ultrashort laser pulses as an energy absorption diagnostic

Author(s): Harrach, R.J.

Author Affiliation: Lawrence Livermore Nat. Lab., CA, USA

Journal: Review of Scientific Instruments vol.61, no.10, pt.2 p. 2985

Publication Date: Oct. 1990 Country of Publication: USA

CODEN: RSINAK ISSN: 0034-6748

U.S. Copyright Clearance Center Code: 0034-6748/90/102985-01$02.00

Conference Title: 8th Topical Conference on High Temperature Plasma Diagnostics

Conference Date: 6-10 May 1990 Conference Location: Hyannis, MA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Theoretical (T); Experimental (X)

Abstract: Summary form only given, as follows. Impulse generation by superintense (I>or approximately=10/sup 16/ W/cm/sup 2/) ultrashort-duration (tau <or approximately=100 fs) laser pulses interacting with solid targets in vacuum, and the possible diagnostic utility of impulse or shock pressure measurements in this regime, are examined by means of computations and simple theory. Easily observable impulse levels, up to several hundred dyne s/cm/sup 2/, should be attainable with present lasers. However, the anticipated rapid attenuation of these high-pressure, short-duration shocks in propagating through the target material will pose a significant challenge for target design. When combined with other diagnostic information (e.g. pulse reflectivity, ablation plasma properties, and plasma radiation **emission**) and a **comprehensive modeling** capability, the author shows that impulse or shock pressure data can clarify the laser/target interaction physics, especially regarding the energy absorption efficiency and depth and the rate energy diffuses into the target during the brief irradiation time. (0 Refs)

Subfile: A

Descriptors: plasma density; plasma diagnostics by laser beam; plasma shock waves

Identifiers: impulse generation; superintense ultrashort laser pulses; energy absorption diagnostic; shock pressure measurements; rapid attenuation; short-duration shocks; pulse reflectivity; ablation plasma properties; plasma radiation emission; laser/target interaction physics; energy absorption efficiency; depth; 100 fs

Class Codes: A5270K (Optical (ultraviolet, visible, infrared) techniques); A5225L (Temperature and density); A5235T (Shock waves)

Numerical Indexing: time 1.0E-13 s

38/5/48 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

02993796 INSPEC Abstract Number: A87131567
Title: Surface plasmon dispersion analysis in the metal-oxide-metal tunnel diode
Author(s): Donohue, J.F.; Wang, E.Y.
Author Affiliation: Dept. of Electr. & Comput. Eng., Arizona State Univ., Tempe, AZ, USA
Journal: Journal of Applied Physics vol.62, no.4 p.1313-17
Publication Date: 15 Aug. 1987 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
U.S. Copyright Clearance Center Code: 0021-8979/87/161313-05$02.40
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T)
Abstract: Three peaks corresponding to the ultraviolet, visible, and near infrared were recently observed in the light emission spectra of a metal-oxide-metal (MOM) tunnel diode. This was the first time UV emission was reported at room temperature with a MOM diode, and it was associated with the radiative surface plasmon. Simple dielectric theory predicts the location of the UV peak as well as the other, but is unable to give a complete description of the spectral output. To gain a clearer understanding of the spectral **emission** , a more **comprehensive** detailed **model** of surface plasmon dispersion in the MOM system is presented. The model is very general and includes the effects that different oxides, metals, and their thicknesses have on the dispersion curves. When applied to simpler systems, the model agrees well with the theoretical work of others. Also, associated with the cathode-oxide interface is a nonradiative mode that is found to play a major role in the transition from the visible to UV peaks in the diode's spectra. (15 Refs)
Subfile: A
Descriptors: dispersion relations; metal-insulator-metal devices; metal-insulator-metal structures; surface plasmons; visible and ultraviolet spectra of inorganic solids
Identifiers: visible emission; near I emission; layer thickness dependence; metal-oxide-metal tunnel diode; light emission spectra; UV emission; radiative surface plasmon; spectral emission; surface plasmon dispersion
Class Codes: A7145G (Exchange, correlation, dielectric and magnetic functions, plasmons); A7320 (Electronic surface states); A7340R (Metal-insulator-metal structures); A7830 (Infrared and Raman spectra and scattering); A7840 (Visible and ultraviolet spectra)

38/5/50 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences

03592267 INSIDE CONFERENCE ITEM ID: CN037822723
RECENT PROGRESS ON NCHRP PROJECT 25-11: THE DEVELOPMENT OF A COMPREHENSIVE **MODAL** EMISSIONS MODEL
Barth, M.
CONFERENCE: On-road vehicle emissions; Proceedings of the eighth CRC on-road vehicle emissions workshop-Workshop; 8th
PROCEEDINGS OF THE CRC ON ROAD VEHICLE EMISSIONS WORKSHOP, 1998; 8TH; VOL 1 P: 2-83-2-106
Atlanta, GA, Coordinating Research Council, 1998
LANGUAGE: English DOCUMENT TYPE: Conference Papers, presentations and report
CONFERENCE SPONSOR: Coordinating Research Council
CONFERENCE LOCATION: San Diego, CA 1998; Apr (199804) (199804)

BRITISH LIBRARY ITEM LOCATION: 6843.550500
DESCRIPTORS: on-road vehicle emissions; coordinating research; CRC

38/5/51 (Item 2 from file: 65)
DIALOG(R)File 65:Inside Conferences

03488973 INSIDE CONFERENCE ITEM ID: CN036784817
The Comprehensive **Modal** Emission Model **(CMEM) for Predicting Light-Duty Vehicle Emissions**
Barth, M.
CONFERENCE: Transportation planning and air quality; persistent problems and promising solutions-Conference; 4th
TRANSPORTATION PLANNING AND AIR QUALITY -CONFERENCE-, 1999; 4TH P: 126-137
Reston, VA, American Society of Civil Engineers, 2000
ISBN: 0784405352
LANGUAGE: English DOCUMENT TYPE: Conference Papers and presentations
CONFERENCE EDITOR(S): Chatter jee, A.
CONFERENCE LOCATION: Lake Lanier, GA
CONFERENCE DATE: Nov 1999 (199911) (199911)

BRITISH LIBRARY ITEM LOCATION: 9026.263000
NOTE:
Includes bibliographical references and index
DESCRIPTORS: transportation planning; air quality

38/5/52 (Item 3 from file: 65)
DIALOG(R)File 65:Inside Conferences

03257350 INSIDE CONFERENCE ITEM ID: CN034431048
NCHRP Project 25-11: The Development of a Comprehensive **Modal** Emissions Model
Barth, M.; Norbeck, J.
CONFERENCE: On-road vehicle emissions-Workshop; 7th
PROCEEDINGS OF THE CRC ON ROAD VEHICLE EMISSIONS WORKSHOP, 1997; 7TH P: 6-53-6-72
Atlanta, GA, Coordinating Research Council, 1997
LANGUAGE: English DOCUMENT TYPE: Conference Papers, presentations and report
CONFERENCE SPONSOR: Coordinating Research Council
CONFERENCE LOCATION: San Diego, CA
CONFERENCE DATE: Apr 1997 (199704) (199704)

BRITISH LIBRARY ITEM LOCATION: 6843.550500
DESCRIPTORS: on-road vehicle emissions; coordinating research; CRC

38/5/53 (Item 4 from file: 65)
DIALOG(R)File 65:Inside Conferences

02082728 INSIDE CONFERENCE ITEM ID: CN021826140
Development of Comprehensive **Modal** Emissions Model : **Operating Under Hot-Stabilized Conditions**
An, F.; Barth, M.; Norbeck, J.; Ross, M.
CONFERENCE: Effects of transportation on energy and air quality-Session
TRANSPORTATION RESEARCH RECORD, 1997; ISSUE 1587 P: 52-62
National Academy Press, 1997
ISSN: 0361-1981 ISBN: 0309061695
LANGUAGE: English DOCUMENT TYPE: Conference Papers
CONFERENCE SPONSOR: National Research Council Transportation Research Board
CONFERENCE LOCATION: Washington, DC
CONFERENCE DATE: Jan 1997 (199701) (199701)

BRITISH LIBRARY ITEM LOCATION: 9026.275000
NOTE:
Held as part of the 76th TRB annual meeting
DESCRIPTORS: TRB; energy; transportation research; air quality

38/5/54 (Item 5 from file: 65)
DIALOG(R)File 65:Inside Conferences

00935141 INSIDE CONFERENCE ITEM ID: CN009124706
Using SAS Software to Develop a Comprehensive **Air Pollutant** Emissions Modeling **System**
Strasser, S. J.; Bruckman, L.
CONFERENCE: 19th Annual conference
SUGI, 1994; 19th P: 603-612
SAS Institute Inc, 1994
ISBN: 1555446116
LANGUAGE: English DOCUMENT TYPE: Conference Papers
CONFERENCE EDITOR(S): Kretzman, P.
CONFERENCE SPONSOR: SAS Users Group International
CONFERENCE LOCATION: Dallas, TX
CONFERENCE DATE: Apr 1994 (199404) (199404)

BRITISH LIBRARY ITEM LOCATION: 8514.121030
DESCRIPTORS: SUGI; SAS users group

38/5/55 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

05108919 JICST ACCESSION NUMBER: 02A0076031 FILE SEGMENT: JICST-E
Power & Energy 2001, Power & Energy society Annual Conference. Comprehensive Evaluation of the Effect of CO2 reduction Options in Commercial and Residential Sectors Considering Long-Term Power Generation Mix.
IWAFUNE YUMIKO (1); YAMAJI KENJI (1)
(1) Univ. of Tokyo
Denki Gakkai Ronbunshi. B(Transactions of the Institute of Electrical Engineers of Japan. B), 2001, VOL.121-B,NO.12, PAGE.1716-1725, FIG.9, TBL.5, REF.10
JOURNAL NUMBER: S0809AAJ ISSN NO: 0385-4213
UNIVERSAL DECIMAL CLASSIFICATION: 621.311.2
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: This paper proposes a **comprehensive model** to examine potential CO2 **emission** reduction in commercial and residential sectors through architectural enhancements and facility improvements considering long-term power generation best mix. The already proposed model of CO2 reduction options on demand side enables the detailed evaluation taken into account of the regional characteristics, such as meteorological conditions and building distributions. This demand side model is integrated with a long-term power generation best mix model to assess long-term potential CO2 emission reduction and the impact of demand side options on the power plant planning in electric power companies in the future. With this approach the prospective power generation structure is figured out and the economic efficiency and potential CO2 emission reduction by options in the commercial and residential sectors of Tokyo are evaluated. (author abst.)
DESCRIPTORS: system operation; power system planning; power generating installation; optimization problem; energy saving; electric power development; carbon dioxide; discharge(effluent); reduction; cost analysis; energy supply; simulation model; commercial facility; dwelling house

BROADER DESCRIPTORS: operation(management); system planning; plan; electric installation; facility; problem; saving; resource development; development; carbon oxide; oxide; chalcogenide; oxygen group element compound; oxygen compound; carbon compound; carbon group element compound; flow rate; variation; business analysis; analysis(separation); analysis; supply; model; facility and building
CLASSIFICATION CODE(S): NB03010W

38/5/56 (Item 1 from file: 6)
DIALOG(R)File 6:NTIS

2228066 NTIS Accession Number: PB2002-102065/XAB
Energy, Air Quality, and Fuels 2001. Energy and Environment. Journal of the Transportation Research Board No. 1750
Transportation Research Board, Washington, DC.
Corp. Source Codes: 044780000
Report No.: ISBN-0-309-07211-5
c2001 108p
Languages: English
Journal Announcement: USGRDR0211
See also PB2001-101970.
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NTIS Prices: PC A07/MF A02
Country of Publication: United States
Contents: Partnership for a New Generation of Vehicles' Fuel Economy Goal: Evaluation of Trade-offs along the Path: Recent Validation Efforts for a **Comprehensive** Modal **Emissions Model ; Modeling** Soak-Time Distributions of Trips for Mobile Source Emissions Forecasting: Techniques and Applications; Design and Administration of Accelerated Vehicle Retirement Programs in North America and Abroad; Emissions Inventory Analysis of Mobile Source Air Pollution in Tel Aviv, Israel; Corrections to Mileage Accumulation Rates for Older Vehicles and the Effect on Air Pollution Emissions; Analysis of Aggregation Effects in Vehicular Emission Estimation; Microscopic Model of Air Pollutant Concentrations: Comparison of Simulated Results with Measured and Macroscopic Estimates; Shared, Small, Battery-Powered Electric Cars as a Component of Transportation System Sustainability; and Effectiveness and Efficiency of Policies to promote Alternative Fuel Vehicles.
Descriptors: *Energy; *Air quality; *Fuels; Motor vehicles; Emissions; Electric vehicles; Natural gas; Environments; Transportation systems; Alternative fuels; Air pollution; Automotive fuels; Policies; Transportation research
Identifiers: NTISNASTRB
Section Headings: 68A (Environmental Pollution and Control--Air Pollution and Control); 97R (Energy--Environmental Studies); 97K (Energy--Fuels); 97G (Energy--Policies, Regulations, and Studies); 85GE (Transportation--General)

38/5/57 (Item 2 from file: 6)
DIALOG(R)File 6:NTIS

2031310 NTIS Accession Number: PB98-104672/XAB
Effects of Transportation on Energy and Air Quality
(Transportation research record)
Transportation Research Board, Washington, DC.
Corp. Source Codes: 044780000
Report No.: TRB/TRR-1587
1997 144p
Languages: English
Journal Announcement: GRAI9801

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NTIS Prices: PC A08/MF A02

Country of Publication: United States

Partial Contents: Alternative Fuel Vehicle Programs: Applicability of Government Incentives; Transitional Alternative Fuels and Vehicles Model; Forecasting Cost Path of Electric Vehicle Drive System: Monte Carlo Experience Curve Simulation; Another Way to Go. Some Implications of Light-duty Diesel Strategy; Use of Episodic Controls to Reduce Frequency and Severity of Air Pollution Events; Conformity: Long-Term Prognoses for Selected Ozone Nonattainment Areas in California; Development of **Comprehensive** Modal **Emissions Model** : Operating Under Hot-Stabilized Conditions; and Implications of Transient Mode Duration for Spatially Disaggregated High-Resolution Emission Inventory Studies.

Descriptors: *Vehicle air pollution; *Alternative fuels; *Highway transportation; Electric vehicles; Diesel engines; Air pollution control; Air pollution abatement; Exhaust emissions; Emission factors; Ozone; Air pollution monitoring; Environmental impact assessments; Urban highways; Travel demand; Mathematical models

Identifiers: Emission inventories; NTISNASTRB

Section Headings: 68A (Environmental Pollution and Control--Air Pollution and Control); 85H (Transportation--Road Transportation); 91A (Urban and Regional Technology and Development--Environmental Management and Planning) ; 91B (Urban and Regional Technology and Development--Transportation and Traffic Planning)

38/5/58 (Item 3 from file: 6)

DIALOG(R)File 6:NTIS

1516736 NTIS Accession Number: PB90-235995

Urban Airshed Model Study of Five Cities. Volume 4. Low-Cost Application of the Model to Atlanta and Evaluation of the Effects of Biogenic Emissions on Emission Control Strategies

Morris, R. E. ; Myers, T. C. ; Causley, M. C. ; Gardner, L. ; Carr, E. L.

Systems Applications, Inc., San Rafael, CA.

Corp. Source Codes: 063315000

Sponsor: Environmental Protection Agency, Research Triangle Park, NC. Office of Air Quality Planning and Standards.

Report No.: EPA/450/4-90/006D

Apr 90 170p

Languages: English

Journal Announcement: GRAI9018

See also Volume 3, PB90-235987 and Volume 5, PB90-236001. Sponsored by Environmental Protection Agency, Research Triangle Park, NC. Office of Air Quality Planning and Standards.

Also available in set of 7 reports PC E99/MF E99, PB90-235953. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

NTIS Prices: PC A08/MF A01

Country of Publication: United States

The document presents Urban Airshed Modeling results showing sensitivity of peak ozone to manmade hydrocarbon emissions reductions for two cases - inclusion and exclusion of biogenic emissions.

Descriptors: *Air pollution control; *Air pollution abatement; *Ozone; Chemical bonds; Hydrocarbons; Photochemical reactions; Atmospheric chemistry; Concentration(Composition); Exhaust emissions; Combustion products; Meteorology; Comparison; Performance evaluation; Site surveys; Cost analysis

Identifiers: Urban Airshed **Model** ; *Air quality; *Atlanta(Georgia); *Natural **emissions** ; **Comprehensive** planning; Carbon bond mechanism; Chemical reaction mechanism; Practice for Low-cost Application in

Nonattainment Regions; State implementation plans; Case studies; Source reductions; Baseline measurements; Volatile organic compounds; Alternative fuels; Fugitive emissions; NTISEPAAQP
Section Headings: 68A* (Environmental Pollution and Control--Air Pollution and Control); 43F* (Problem Solving Information for State and Local Governments--Environment); 91A* (Urban and Regional Technology and Development--Environmental Management and Planning); 99E (Chemistry--Photo and Radiation Chemistry)

38/5/59 (Item 4 from file: 6)
DIALOG(R)File 6:NTIS

1185156 NTIS Accession Number: PB85-212306
Indoor Air Quality Modeling Workshop Report
McNall, P. E.
National Bureau of Standards (NEL), Gaithersburg, MD. Building Physics Div.
Corp. Source Codes: 081915020
Sponsor: Environmental Monitoring Systems Lab., Research Triangle Park, NC.
Report No.: NBSIR-85/3150
May 85 16p
Languages: English
Journal Announcement: GRAI8518
Sponsored by Environmental Monitoring Systems Lab., Research Triangle Park, NC.
Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A02/MF A01
Country of Publication: United States
Comprehensive modeling of **emission** , absorption, movement, and controls of indoor air contaminants is essential for developing national policy for IAQ assessment and controls. This report describes several topics discussed in a workshop on indoor air quality, which was held on February 11, 1985 at the National Bureau of Standards. Researchers on IAQ modeling were invited to state their current activities, identify future research needs and recommend specific parameters and contaminants to be included in the IAQ models. The input thus obtained in this workshop will be incorporated in an advanced simulation model for IAQ, to be developed by NBS under a contract with EPA.
Descriptors: *Air pollution control; *Mathematical models; *Regulations; Absorption; Air circulation; National government
Identifiers: *Indoor air pollution; *Air quality; NTISCOMNBS; NTISEPAORD
Section Headings: 68A (Environmental Pollution and Control--Air Pollution and Control); 43F (Problem Solving Information for State and Local Governments--Environment); 91A (Urban and Regional Technology and Development--Environmental Management and Planning)

38/5/60 (Item 5 from file: 6)
DIALOG(R)File 6:NTIS

0679005 NTIS Accession Number: PB-276 350/6/XAB
Review of Diesel Combustion Models for NOx and Smoke Emissions
(Final rept. Jun-Nov 76)
Anderton, D.
Southampton Univ. (England). Inst. of Sound and Vibration Research.
Corp. Source Codes: 401830
Sponsor: Transportation Systems Center, Cambridge, Mass.
Report No.: DOT-TSC-OST-76-57
Oct 77 166p
Journal Announcement: GRAI7808

Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

NTIS Prices: PC A08/MF A01

Contract No.: DOT-TSC-1101

A **comprehensive** review of diesel **emissions models** is presented together with assessments of the pertinent fundamental NOx and soot kinetics. The results of diesel emissions experiments carried out at Southampton are also presented and correlations are suggested. The review suggests that available emissions models do not incorporate a sufficiently detailed description of the fundamental mixing and chemical kinetic processes occurring in the diesel. They cannot therefore be used predictively. Suggestions are made for model development, fundamental data acquisition and the use of incylinder experimental techniques. The latter are required to obtain data on the flowfield and mixing processes occurring in the diesel combustion chamber.

Descriptors: *Diesel engines; *Mathematical models; *Reviews; *Nitrogen oxides; *Air pollution; Exhaust emissions; Regulations; Reaction kinetics; Fluid mechanics; Soot; Smoke; Numerical analysis

Identifiers: NTISDOTOS; NTISDOTTSC

Section Headings: 68A* (Environmental Pollution and Control--Air Pollution and Control)

38/5/61 (Item 1 from file: 95)

01221590 M98070859545

Scaling laws for NO(x) emission performance of burners and furnaces from 30 kW to 12MW

Hsieh, T-CA; Dahm, WJA; Driscoll, JF
Univ. of Michigan, Ann Arbor, USA

Combustion and Flame, v114, n1/2, pp54-80, 1998
Document type: journal article Language: English
Record type: Abstract
ISSN: 0010-2180

ABSTRACT:
A general analytical approach for scaling NO(x) emissions from burners and furnaces is presented, together with the scaling model for NO(x) emissions performance that results when this approach is applied to a broad class of swirl-stabilized industrial gas burners. The model is based on results from a set of collaborative burner scaling experiments on a generic gas burner and furnace design at five different scales having near-uniform geometric, aerodynamic, and thermal similarity and uniform measurement protocols. This collaborative effort provides the first NO(x) scaling data over the range of thermal scales from 30 kW to 12 MW, including input-output measurements as well as detailed in-flame measurements of NO, NO2, CO, O2, unburned hydrocarbons, temperature, and velocities at each scale. The in-flame measurements allow identification of key sources of NO(x) production. The underlying physics of these NO(x) sources lead to scaling laws for their respective contributions to the overall NO(x) emissions performance. It is found that the relative importance of each source depends on the burner scale and operating conditions. The scalings for these NO(x) sources are combined in a **comprehensive** scaling **model** for NO(x) **emission** performance. Results from the scaling model show good agreement with experimental data at all burner scales and over the entire range of turndown, staging, preheat, and excess air dilution, with correlations generally exceeding 90 %. The scaling model permits design trade-off assessments for a broad class of burners and furnaces, and allows performance of full industrial-scale burners and furnaces of this type to be inferred from results of small-scale tests.

DESCRIPTORS: GAS BURNERS; OIL BURNERS; POLLUTANT EMISSION; INDUSTRIAL FURNACES; HEATING CAPACITY; NITRIC OXIDES; COMPUTATIONAL PROCEDURE;

AERODYNAMICS; TEMPERATURE DEPENDENCE; ECONOMIZER; EXHAUST AIR; COMBUSTION; AIR EXCESS; HEAT EXCHANGE; DIMENSIONING; PERFORMANCE DOMAIN; INPUT--POWER; DWELL TIME; TEMPERATURE; PERFORMANCE EVALUATION
IDENTIFIERS: VERBRENNUNGSTEMPERATUR; BRENNERGROESSE; HOCHTEMPERATURZONE; Berechnung; Schadstoffemission; Brenner; Industrieofen

38/5/63 (Item 1 from file: 63)
DIALOG(R)File 63:Transport Res(TRIS)

00823802 DA
TITLE: INTEGRATING A COMPREHENSIVE **MODAL** EMISSIONS MODEL **INTO ATMIS TRANSPORTATION** MODELING **FRAMEWORKS**
AUTHOR(S): Barth, Matthew; Malcolm, Carrie; Scora, George
CORPORATE SOURCE: University of California, Berkeley. Institute of Transportation Studies, Partners for Advanced Transit and Highways (Calif.), University of California, Riverside. Center for Environmental Research and Technology, California. Dept. of Transportation,
REPORT NUMBER: UCB-ITS-PRR-2001-19
JOURNAL: PATH research report ; UCB-ITS-PRR-2001-19 Pag: 48 p.
SUPPLEMENTAL NOTES: Publication Date: August 2001. California PATH Program, Institute of Transportation Studies University of California, Berkeley CA. Remarks: Also available on the World Wide Web at http://www.path.berkeley.edu/PATH/Publications/PATH/index.html. Format: website
PUBLICATION DATE: 20010000 PUBLICATION YEAR: 2001
LANGUAGE: eng SUBFILE: PATH
SOURCE ACCESSION NUMBER: PATH Record Number 24083
ISSN: 1055-1425
AVAILABILITY: Item held at Univ. of Calif., Berkeley, Inst Transp Studies Lib Refer to: http://www.lib.berkeley.edu/ITSL/services.html
DATA SOURCE: UC Berkeley Transportation Library - PATH Database
ABSTRACT: This report describes a project which examined key interface issues between the state-of-the-art **Comprehensive** Modal **Emissions** /Energy Consumption (CME/EC) **model** and Intelligent Transportation Systems (ITS) simulation models developed within the California PATH program . Methodologies for integrating different ITS transportation models/da ta sets (such as PARAMICS) with the CME/EC model, were established. After the integration, two case studies were conducted using the PARAMICS/CME-EC tool. The first study looked at the emissions impac t of high occupancy toll (HOT) lanes along the SR-91corridor in Southe rn California. The other study looked at the emissions impact associat ed with redesignating uphill lanes on I-60 near Riverside, California. As a result of these case studies, the integrated transportation/emissions model was completely debugged.
DESCRIPTORS: Advanced traffic management systems; Environmental impacts

38/5/64 (Item 2 from file: 63)
DIALOG(R)File 63:Transport Res(TRIS)

00806253 DA
TITLE: STATISTICAL ANALYSIS AND MODEL VALIDATION OF AUTOMOBILE EMISSIONS
AUTHOR(S): Schulz, Daniel; Younglove, Theodore; Barth, Matthew
CORPORATE SOURCE: Bureau of Transportation Statistics, 400 7th Street, SW, Room 3430 , Washington, DC, 20590-,
JOURNAL: Journal of Transportation and Statistics Vol: 3 Issue Number: 2 Pag: pp 29-38
PUBLICATION DATE: 20000900 PUBLICATION YEAR: 2000
LANGUAGE: English SUBFILE: HRIS (H)
ISSN: 10948848
AVAILABILITY: Bureau of Transportation Statistics; 400 7th Street, SW, Room 3430 ; Washington; DC ; 20590-
ORDER NUMBER: N/A

FIGURES: 5 Fig.
REFERENCES: Refs.
ABSTRACT: The article discusses the development of a **comprehensive** modal **emissions model** that is currently being integrated with a variety of transportation models as part of National Cooperative Highway Research Program project 25-11. Described is the second-by-second engine-out and tailpipe emissions data collection on 340 light duty vehicles that were tested under "as is" conditions. The variability of emissions were observed between and within groups over different driving modes. The initial statistical analysis and model validation methods are summarized.
DESCRIPTORS: Statistical analysis; Model atmosphere; Emission control systems; Vehicle tests; Exhaust gases
SUBJECT HEADING: H17 ENERGY AND ENVIRONMENT; H53 VEHICLE CHARACTERISTICS; I95 VEHICLE TESTING

38/5/65 (Item 3 from file: 63)
DIALOG(R)File 63:Transport Res(TRIS)

00802661 DA
TITLE: COMPREHENSIVE **PM10** EMISSION **INVENTORIES, DISPERSION** MODELLING **AND POPULATION EXPOSURE FOR SWITZERLAND**
AUTHOR(S): JOUMARD, R(ED); DE HAAN, P; HELDSTAB, J; FILLIIGER, P; KUENZLE, T
CORPORATE SOURCE: INSTITUT NATIONAL DE RECHERCHE SUR LES TRANSPORTS ET LEUR SECURITE (INRETS), 2 AVENUE DU GENERAL MALLERET-JOINVILLE, ARCUEIL CEDEX , F-94114, FRANCE
JOURNAL: TRANSPORT AND AIR POLLUTION - 9TH SYMPOSIUM - VOL 1 ORAL COMMUNICATIONS Pag: 175-82
PUBLICATION DATE: 20000600 PUBLICATION YEAR: 2000
LANGUAGE: ENGLISH SUBFILE: IRRD (I)
IRRD DOCUMENT NUMBER: E106757
ISSN: 0769-0266 ISBN: 2-85782-533-1
REFERENCES: 4
DATA SOURCE: Transport Research Laboratory (TRL)
ABSTRACT: The new Swiss PM10 model simulates particles from primary PM10 emissions, secondary aerosols from precursor concentrations and regional PM10 components due to emissions from surrounding European countries. The model is implemented in a geographical information system. Results for 1997 of the first model version show that a large area of the Swiss Plateau, with most (sub-)urban locations, have concentration values above the ambient air quality standard of 20 mg m-3. Since mainly the built-up area is concerned, 61% of the inhabitants (4.3 million of persons) live within the area of excessive PM10 pollution levels. The model results are already used as a tool for regional air pollution management. The second version of the model, to be completed in the year 2000, will introduce separate modeling of PM10 and PM25 concentrations, new emission factors for road transport and a revised dispersion model. (A) For the covering abstract see ITRD E106738.
DESCRIPTORS: Dispersion (Statistics); Concentration (Chemistry); Air pollution; Pollutants; Particles; Switzerland; Dispersion (Stat); Concentration (Chem); Emission

38/5/66 (Item 4 from file: 63)
DIALOG(R)File 63:Transport Res(TRIS)

00743722 DA
TITLE: ANALYSIS OF MODAL EMISSIONS FROM DIVERSE IN-USE VEHICLE FLEET
AUTHOR(S): Barth, M; Younglove, T; Wenzel, T; Scora, G; An, F; Ross, M; Norbeck, J
CORPORATE SOURCE: Transportation Research Board, 2101 Constitution Avenue, NW , Washington, DC, 20418,

JOURNAL: Transportation Research Record Issue Number: 1587 Pag: pp 73-84
SUPPLEMENTAL NOTES: This paper appears in Transportation Research Record No. 1587, Effects of Transportation on Energy and Air Quality.
PUBLICATION DATE: 19970000 PUBLICATION YEAR: 1997
LANGUAGE: English SUBFILE: HRIS (H)
ISSN: 03611981 ISBN: 0309061695
AVAILABILITY: Transportation Research Board Business Office; 2101 Constitution Avenue, NW ; Washington; DC ; 20418
ORDER NUMBER: N/A
FIGURES: 8 Fig. TABLES: 5 Tab.
REFERENCES: 6 Ref.
ABSTRACT: The initial phase of a long-term project with national implications for the improvement of transportation and air quality is described. The overall objective of the research is to develop and verify a computer model that accurately estimates the impacts of a vehicle's operating mode on emissions. This model improves on current emission models by allowing for the prediction of how traffic changes affect vehicle emissions. Results are presented that address the following points: vehicle recruitment, preliminary estimates of reproducibility, preliminary estimates of air conditioner effects, and preliminary estimates of changes in emissions relative to speed. As part of the development of a **comprehensive** modal **emissions model** for light-duty vehicles, 28 distinct vehicle/technology categories have been identified based on vehicle class, emission control technology, fuel system, emission standard level, power-to-weight ratio, and emitter level (i.e., normal versus high emitter). These categories and the sampling proportions in a large-scale emissions testing program (over 300 vehicles to be tested) have been chosen in part based on emissions contribution. As part of the initial model development, a specific modal emissions testing protocol has been developed that reflects both real-world and specific modal events associated with different levels of emissions. This testing protocol has thus far been applied to an initial fleet of 30 vehicles, where at least 1 vehicle falls into each defined vehicle/technology category. The different vehicle/technology categories, the emissions testing protocol, and preliminary analysis that has been performed on the initial vehicle fleet are described.
DESCRIPTORS: COMPUTER MODELS; IMPACTS; VEHICLE OPERATING MODES; EMISSIONS; MODAL EMISSIONS MODELS; LIGHT VEHICLES; EMISSIONS TESTING PROTOCOL
SUBJECT HEADING: H17 ENERGY AND ENVIRONMENT; I93 VEHICLE NUISANCE

38/5/67 (Item 5 from file: 63)
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TITLE: MOBILE SOURCES EMISSIONS INVENTORY FOR THE MELBOURNE AIRSHED STUDY
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ABSTRACT: The environment protection authority is conducting a study which includes the development of an air pollution model for the Melbourne airshed. A necessary input to this **model** is a **comprehensive emissions** inventory of the study area. Data were collected for both stationary and mobile sources. The mobile sources emissions inventory describes both spatial and temporal distributions for a typical Melbourne vehicle fleet. Data on vehicle kilometres travelled were used in conjunction with emission factors to determine the fleet emissions. Known traffic speed- flow relationships were used to select four general conditions of traffic flow. The standard driving cycle, as used in US and Australian emissions and fuel consumptions test methods, was examined and portions were selected to represent each of the four conditions. Emission factors were then developed for each of the conditions for emission controlled vehicles (a). The paper was presented as Paper 14-Session 5-Emissions Modelling (SAE 82144). The number of the covering abstract of the conference is TRIS no. 367871. (TRRL)

DESCRIPTORS: AIR POLLUTION; MATHEMATICAL MODELS; URBAN AREAS; SOURCES; EXHAUST EMISSION; TRAFFIC SPEED; TRAFFIC FLOW; CONFERENCE; EXHAUST FUMES; INVENTORY; AIR POLLUTION; AUSTRALIA; METHOD; VEHICLE; SPEED; TRAFFIC FLOW; MOTORWAY; IDLING (ENGINE); MATHEMATICAL MODEL; AUSTRALIA

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